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THE UNIVERSITY OF ALBERTA

A DESCRIPTIVE ANALYSIS OF COACHING BEHAVIOR

BY

© PETER MICHAEL USHER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
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DEPARTMENT OF PHYSICAL EDUCATION

EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

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ABSTRACT

The primary purpose of the study was to provide, through a scientific identification, a description of coaching behavior. The descriptive in depth, case study analyzed the coaching behaviors of a nationally recognized coach utilizing an observation technique of data gathering developed out of the behavioral school of psychology. The observation schedule, Alberta Coach Observation Schedule, provided a method of obtaining data from original events via video tape recordings.

The data treatment designs were: 1) a three by three cell matrix which allowed a descriptive analysis to be made of the relationships between the Behavior, Behavior Direction, and Practice Phase categories relative to the three Season and three Practice variables, and 2) a Behavior Sequence Matrix which preserved the original serial context of the behaviors.

The predominant coaching behaviors exhibited by the coach in this study were Directing, Attending, Monitoring, Praise, and Explaining. The displayed coaching behaviors were consistent in their frequency of emissions throughout the season. The two major behavior sequences identified in the study were:

1. Verbal Instruction followed by Verbal Instruction which was

followed in turn by Attending and more Verbal Instruction.

2. Verbal Instruction followed by Verbal Instruction which was in turn followed by Attending and Performance Information.

Finally, it was recommended that future research should direct itself to the relationship of the antecedent and consequent behaviors of coach-athlete behavior.

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Coaching in Canada is undergoing radical change. Within the last five years there has been a surge of financial aid provided by various agencies designed to improve the expertise and knowledge of the Canadian coach. Sport Canada and the Coaching Association of Canada, along with the assistance from the O'Keefe Sports Foundation, have initiated aid programs to the National Sport Governing Bodies (NSGB) to accomplish this objective.

In the process of developing new coaching programs, consideration has been given to disciplines such as motor learning, biomechanics, growth and development, sport medicine, and sport psychology. The National Coaching Development Program, presently being administered by the Provincial Directors of Recreation, has combined such related disciplines to develop the general theoretical elements of coaching in Canada. The NSGB are responsible for the specific technical and practical portions of the development program.

Other than a few scattered university programs offering undergraduate and graduate degrees in coaching, the beginning coach receives little, if any, professional preparation. The beginning coach usually models his coach of earlier times, and if he improves, it is only in the light of his own unaided experience. In many quarters of sport in Canada it is argued that a good coach is simply one who knows his subject matter and is interested in it. Any special knowledge of pedagogy as a basic science of coaching is felt to be unnecessary. This attitude is regrettable. The coaching enterprise cannot improve to its fullest extent until its basic processes have been examined. A really effective coaching system cannot be initiated until we understand the processes of learning and coaching. To Skinner (1968) "Human behavior is far too complex to be left to casual experience," or even to organized experience in the restricted environment of the athletic arena. Coaches need help. In particular they need the kind of help offered by a scientific analysis of coaching behavior. If coaches are concerned with facilitating athletes' acquisition and performance of complex motor skills then they have a need for learning theory, or better still, a technology of coaching. To upgrade this psychological aspect of the coaching system requires prompt attention applied in an uncomplicated manner.

At present the NSGB have attempted to improve the quality of coaching in Canada by providing detailed manuals and conducting frequent technically oriented clinics for their coaches. Unfortunately coaching methodology is rarely included. The introduction of coaching behavior analysis might complement these attempts. An understanding of the interactive process between coach and athlete in the sport environment would be beneficial to coaches and prospective coaches.

With the lack of research in the area of sport coaching, no definite identification of coaching behaviors has been made. Similarly, no conclusions regarding the existence of common behaviors or styles of coaches has been made. It may then be suggested that without fully understanding the "interactive process" existing in coaching, the efforts to improve the coaching programs will be difficult. Through this research a contribution toward discovering and understanding coaching behaviors, including a process for scientifically analysing coaching behaviors, may be made.

Statement of the Problem

The present study focused on the following questions:

1. What are the predominant coaching behaviors exhibited by a university coach?
2. Are these coaching behaviors consistent?
3. Can behavior patterns be identified?

While there is no intention to suggest that one particular behavior or style of coaching is superior to another, the study seeks to identify behavior patterns of a university hockey coach.

Past Research on Coaching

Much of the research investigating coaching has been concerned with the attributes of coaches (Stampfl, 1955; Counsilman, 1965) and with personality variables (Ogilvie and Tutko, 1966 and 1967; Hendry, 1969; and Tutko and Richards, 1971). Despite these observations, experiences, and some research that indicates a personality profile for the successful coach, conflicting research results suggest that the common characteristics of these coaches have yet to be established.

Singer (1972) suggests a number of determinants for success in coaching. They are: 1) personal qualities - intelligence, leadership, etc., 2) human relations - understanding, sensitivity and communication, etc., 3) personal experience such as previous coaching and athletic participation, and 4) formal education. Singer does not mention a need for learning and coaching methods.

These efforts in sport psychology research have been directed towards producing ordered and simplified descriptions of coaches. There has been a strong tendency to stereotype many categories of individuals. The process of producing "types," according to Rushall (1973d), usually follows one of two methods, 1) personality assessments are analyzed to produce a general description or profile, and/or 2) isolated impressions are used to indicate a general behavior description.

Criticisms of Past Research

The past uses of personality tests in sport research have been severely criticized (Rushall, 1969; Kroll, 1970). Martens (1975) offers a good critique of sport personality research. The use of personality assessments is suspect because of certain limitations including the test itself, the way the test is used, the experimenter's objectivity and reliability, the subjects, data treatments, and analyses.

Tutko and Richards (1971) have postulated five different classes of coaches, viz. "Hard-nosed," "nice-guy," "easy-going," "driven," and "business-like." This stereotypic approach over-simplifies the complexity of human behavior. It is also felt that coaches are typed principally on one or two dimensions by journalists, broadcasters, and pseudo-academic coaches. These descriptions are generally difficult to substantiate and their source often remains private to the observer.

Towards a Science of Coaching

It has been long assumed that giving explanations and instructions are the sine qua non of coaching. For many coaches, coaching has become the counterpart of telling. Not only do coaches rely on talking, but they do considerably more talking than their athletes. Galloway (1971) reports from his research that the acts of teaching and learning are more than verbal; that teacher influence can occur without words. While words may be the preferred means of teaching, they do not represent the only medium for learning. Expressions, demonstrations, and modelling behaviors are excellent non-verbal devices for developing understanding and comprehension.

Coaching, like teaching, is the arrangement of the learning environment and the contingencies of reinforcement which expedite learning. An athlete can learn without being coached, but he can learn more effectively under favourable conditions. Teachers have always arranged effective contingencies when they have taught successfully, but they are more likely to do so if they understand what they are doing (Skinner, 1969). Earlier, Skinner (1968) suggested that the application of operant conditioning to education is simple and direct. A corollary can be made to coaching. Athletes do learn without coaching in their natural environments, but coaches arrange special contingencies which expedite learning, hastening the appearance of behavior which would otherwise be acquired slowly or making sure of the appearance of behaviors which might otherwise never occur.

The most widely publicized efforts of the aforementioned agencies to improve coaching show an extraordinary neglect of attention to methods of coaching. Learning and coaching are not analyzed, and almost no effort is made to improve coaching as such. The aid which coaching receives usually means money, and the proposals for spending it follow a few familiar lines. More and better arenas and pools, etc., should be created and erected. "Better" athletes should be sought, and have made available to them government financial assistance to continue their training programs. New, and obviously better, training programs should be devised and implemented. Coach-athlete contacts with films and other audio-visual devices should multiply. More and better coaches should be recruited (but where do "better" coaches come from?). All this can be done without looking at coaching itself. How we might ask are these "better" coaches to coach those better athletes in those better facilities, what kind of contacts are to be multiplied through the mass media, or how are new coaching and training programs to be made effective?

Given the lack of empirical evidence on the coaching process, the ultimate decision as to what is and what is not significant in coaching very often has to be based on the philosophical, hypothetical, or personal biases of the researcher. To overcome these (and other) problems, it is suggested that a developed system (Fishman and Anderson, 1971) is required for observing and recording the coaching process.

Rushall (1973a) has attempted to draw the attention of sports psychologists to provide consultation services for coaches, and sport organizations. He states a growing need for telling interested parties how to achieve desirable performance ends is evident. Rushall proposes a combination of systems analysis and applied behavior analysis for providing a vehicle for offering a consultation service. One of the main requirements for effective communication in such a service is that the content remains observable and measurable. With this restriction, behaviors in the sporting environment are assessed.

Attention has been given to the business of arriving at final judgments about effective coaching without giving sufficient attention to understanding the phenomenon of coaching itself. What is needed is a research effort designed to examine and describe the coaching process, an effort that will permit a better understanding of what actually happens in those real world settings where coaches and athletes interact.

Alderman (1968) identifies, as a primary purpose of sport psychology, the systematic study of the problems with which every coach must deal when he applies his technical knowledge.

Towards an Empirically-Based Analysis of the Coaching Process

In these times of revolutionary change in attitudes towards coaching in sport, there is particular need for a more thorough and empirically based understanding of the coaching process. Descriptive analytic research, as described by Anderson (1971), could provide the tools of inquiry as well as the data needed to intelligently monitor and guide the process of change in coaching methodology.

Research in other subject areas which describes and analyses the teaching process indicates that this type of research has considerable immediate and potential value. It would seem that sport might profit substantially from a research endeavour focused on the explication of the "process of coaching physical activity," especially during this time of increased awareness for improved coaching.

Descriptive analytic research is a method of objectively recording behaviors of one or more people either alone or in interaction. It is an observation procedure designed to minimize the possibility of observer bias, to permit a systematic record of spontaneous acts, and to scrutinize the types of behaviors that do, in fact, occur.

The essential features of a descriptive analysis include: 1) a standardized set of procedures for observing events in coaching, 2) a recording instrument that carefully specifies operationally defined categories of observable behaviors and provides a coding system for the efficient classification of observed behaviors into categories, and 3) a procedure for presenting the data collected in some meaningful form (Fishman and Anderson, 1971).

Standard procedures will allow accurate descriptive records of events in actual settings to be collected either through trained observers or through the use of videotaped events. The observer reviews the tapes and classifies the events according to the recording instrument. The analysis of data takes several forms. In most studies, however, the frequency of different types (categories) of behavior is tabulated, relationships among categortes are examined, and common sequences of behavior (patterns) are identified.

The intent of the analysis will be to provide a clearer "picture" of what transpires in terms of important dimensions of the coaching process. The analysis does not make evaluative judgments about the coaching method; instead it focuses on the rather modest goal of "accurately describing real world events" (Fishman and Anderson, 1971) in the gymnasium or on the playing field, and analyzing these events in a way that leads to better understanding of what transpired in the coaching process.

An applied behavior analysis approach would systematically study the relationship between the behaviors and their environmental antecedents and consequences. By establishing the relationship of what events characteristically precede or follow a behavior the analyst can determine how to increase, decrease, or maintain the behavior.

What applied behavior analysis can provide is objective feedback as to the type and quantity of coach-athlete interaction, and this knowledge enables the coach to take steps to bring his actual and his desired behaviors into closer alignment. This would be in line with the consultation suggestions of Rushall.

The feedback provided by the behavior analysis procedure enables the coach to see the relationship between his behavior and that of his players and thereby permits systematic modification of coaching behavior to produce a desired change in player behavior.

Rushall (1973a) describes characteristics of assessment methods as being 1) applied, in that they are of immediate concern to the coaches, 2) behavioral, that is, what the coaches do is studied rather than what they say or think, 3) analytic, in that the events which are responsible for the occurrence or non-occurrence of performance are studied, and 4) communicable, that is, they can be understood by the layman. He suggests that by coordinating and comparing these data, assessments of motivation, interaction, and the effectiveness of coaching is revealed. Behavior and activity problems can also be located. Rushall feels that this restricted view of the sporting environment has two major advantages, 1) the scope of the analysis is manageable, and 2) the content is understandable by all concerned parties.

Justification for the Study

There appears to be a need for a sequential research effort which starts with the development of systems for describing events in sport settings and then utilizes this research information to enhance the quality of coach training programs and of coaching itself.

Borrowing heavily from Anderson (1971) the following describes crucial stages of such a sequence:

1. The development of systems which adequately describe events in coaching sport activities.
2. Using the systems to acquire large samples of descriptive data which describe what is happening in coaching sessions.
3. The descriptive systems might be used to examine the nature of existing and innovative methods. For example, what specific patterns of coach behavior characterize a method and are they consistent over time?
4. Using the tools and the results of descriptive studies as a basis for conducting experimental and evaluative studies focusing on measuring the relationships between coaching and learning. Descriptive systems would be utilized to insure that specific methods did actually occur and to control the implementation of these methods; to establish cause and effect relationships between specific and identifiable coaching events and athletic learning.
5. Utilization of the accumulating body of information to enrich coach education programs. Prospective coaches might be encouraged to critically examine alternative patterns of coaching behavior and to design and implement behavior patterns in their own coaching which emerge from this critical examination.

Definition of Terms

Behavior analysis: a method of objectively identifying and determining the precise quantitative elements of any observable and measurable acts which permit the gathering of data.

Coaching: the development and control of sport related behaviors.

Limitations of the Study

The study is not looking at:

a) Interactions between athlete and coach.

b) Effects of coach behavior upon player behavior.

The present study looks at coaching behavior as both an antecedent and a consequence of player behavior. However, the study does not discriminate between the antecedents and consequences because it does not study the coach's behavior in relationship to the behavior of the players.

It is essential to recognize the limitation that the presence of an observer during a coaching session may effect coaching behavior. While every attempt was made to exclude any value judgments which may be influential to the study, the researcher recognizes the possibility of this limitation.

Delimitations of the Study

The study will be delimited to a preliminary description of behavior of a university level hockey coach involved in the coaching of university athletes; to a coach employed by the University of Alberta, 1976-77; to the examination of coaching behaviors of this coach; to the use of the Alberta Coach Observation Schedule (ACOS) for analyzing coaching behavior.

Outline of the Study

The state of applied behavior analysis research in the area of sport is in an embryonic stage. This study was therefore designed to be descriptive and exploratory in nature. "If very little is known about a phenomenon the way to begin investigation of it is to analyze the phenomenon itself (Smith and Meux, 1962, p. 8)."

The descriptive, in depth case study analyzed the coaching behaviors of a nationally recognized hockey coach utilizing an observation technique of data gathering as prescribed by the behavioral school of psychology. The observation schedule provided a method of obtaining data from original events.

The observation schedule was developed by the writer in the first phase of the study. The observation schedule developed by Tharp and Gallimore (1976) to observe a university level coach, and the Dalhousie Coach Observation Schedule (DCOS) devised by Rushall (1973c) constituted a foundation for the schedule. A category was added according to the specific need exhibited during Phase I.

Chapter I introduces the problem under study, provides background information, justifies the need for the study, and describes the operational definitions, limitations, and delimitations. Chapter II provides the theoretical background necessary for the study, while Chapter III describes the observation and measurement procedures that were employed to carry out the study. The findings and interpretations are presented in Chapter IV, and Chapter V summarizes the findings, and describes conclusions and implications of the study.

7

CHAPTER II

THEORETICAL BACKGROUND

The Origins of a Science of Behavior

In 1913, John Broadus Watson published what was in effect the manifesto of a new American psychology:

> Psychology as the behaviorist views it is a purely objective branch of natural science. His theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its methods, nor is the scientific value of its data dependent upon the readiness with which they lend themselves to interpretation in terms of consciousness.

Watson challenged the mentalistic notions which were abounding in American psychology and questioned by human behavior was not studied objectively and without reference to consciousness and its unreliable introspective data.

Clark L. Hull theorized the principal of reinforcement into more solid terms from Thorndike's Law of Effect, by positing the notion of drive. A drive, to Hull, was any aroused state of an organism, and any stimulus that reduced a drive was reinforcing. Hull sought to do for psychology something similar to that which Newton had done for physics: establish a broad and detailed body of principles that would be applicable to the whole range of behavioral phenomena. Hull had received his early training in engineering, and as Winnifred Hill (1963) notes, "something of the engineer's outlook is evident in his desire to construct an elaborate, formal, precise structure of psychological theory."

For Hull the science of behavior eventually became the study of central processes, mainly conceptual but often ascribed to the nervous system. The processes were not directly observed and seemed therefore to require hypotheses and deductions. Behavior, claims Skinner (1969) is one of those subject matters which do not call for hypothetico-deductive methods. He states that both behavior itself and most of the variables of which it is a function are usually conspicuous. The behavior generated by a given set of contingencies can be accounted for without appealing to hypothetical inner states or processes. To more adequately formulate the interaction between an organism and its environment Skinner suggests we use the rates of responding as a dependent variable.

A natural datum in a science of behavior is the probability that a given bit of behavior will occur at a given time. An experimental analysis deals with that probability in terms of frequency or rate of responding, and that each separate instance of an operant, as Skinner calls it, can be counted.

Operant (Skinnerian) psychology has generated principles of behavior which have led to a behavior technology known as applied behavior analysis. In the late 1950's there was an increasing amount of application of these behavior principles to humans. The remarkable growth and success of these applications within the last decade have become legend. Applied behavior analysis has made progressive and effective advances in education.

Applied Behavior Analysis

The analysis of individual behavior is a problem in scientific demonstration, reasonably well understood (Skinner, 1953, Sec. 1), comprehensively described (Sidman, 1960), and quite thoroughly practiced (Journal of Experimental Analysis of Behavior, 1957-; Journal of Applied Behavior Analysis, 1968-). That analysis has been pursued in many settings over many years because, as Skinner (1969) has pointed out, "the scientific method which has made experimental analysis of behavior successful in the laboratory is immediately available for practical purposes." Although the initial impetus for this area of study did stem from Skinner's work, the names that are recently more frequently associated with applied behavior analysis are Baer, Becker, Bijou, Engelmann, Hall, Lindsley, Patterson, Tharp and Wetzel.

Analytic behavior application is the process of applying sometimes tentative principles of behavior to the improvement of specific behaviors, and simultaneously evaluating whether or not any changes noted are indeed attributable to the process of application - and if so, to what part of the process. In short, analytic behavioral application is a self-examing, self-evaluating, discovery-oriented research procedure for studying behavior. Its procedures are therefore relevant whenever a change in behavior is a consideration.

Applied research is constrained to examining behaviors which are socially important (Baer et al, 1968), and very frequently within their usual social settings. The label "applied" is not determined by the research procedures used but by the interest which society shows in the problems being studied. As Skinner (1969) so aptly puts it, "the experimental analysis of behavior dispenses with theories of probability or decision-making by proceeding to find out."

Characteristics of Applied Behavior Analysis

There are several important characteristics of applied behavior analysis which have been identified (Baer et al, 1968; Rushall, 1973b). It is applied. The immediate concern of a project is the behavior of the individual(s) involved. The importance of the behavior in a social context is stressed rather than relating the behavior to some theory. It is behavioral. Behaviorism and pragmatism seem often to go hand in hand. Applied research is emminently pragmatic. The relevant question is not what he can say, but what he can do. It is analytic. The events which are responsible for the occurrence or non-occurrence of a behavior are determined. It is technological. Since the behavior of an individual is composed of physical events, its scientific study requires their precise measurement. The events in the behavior analysis are described and identified. It is effective. The results of applications are of practical importance rather than scientific value. It is practical. Applications are only deemed successful if produced effects are large enough to be of practical value. It should display some generality. It is conceptually systematic. The concern of applications and studies is to utilize the principles of behavior rather than to test an isolated concept or theory.

Development of Coding Systems for Educational Research

Observation of teaching behavior has been accepted as a desirable and necessary practise in educational settings for some years. More recently the emphasis in research has been designed to describe more precisely what goes on between students and teachers in the classroom. To collect such information, students of human behavior have devised elaborate coding systems which systematically record the ongoing behaviors of the participants.

Successful methods of analyzing classroom behavior have been developed by Withall (1949), Flanders (1960, 1966, 1967, and 1971), Lewis, Newell and Withall (1961), Smith and Meux (1962), Galloway (1963), Amidon and Hunter (1966), Bellack (1966, 1967), Hough (1967), Stillwell (1967), Traill (1971) and others. With very few exceptions, such methods rely on an analysis of the verbal interaction within the classroom. The primary distinction among these methods lies in the manner in which the types of interaction are categorized. For example, Flanders (1960, 1966) provided a basic instrument for analyzing classroom behavior and Amidon and Hunter provided a translation of knowledge gained from the research in classroom verbal interaction into usable practical course material. Smith and Meux (1962) developed thirteen categories for viewing teaching behavior in classrooms and Bellack reported detailed analysis of what he referred to as "teaching cycles." The systems have been effecitvely used for teacher and teacher-trainee behavior modification.

Analysis of Teacher Behavior in Physical Education

Since 1960, a number of objective systems for the observation of specific behavior in a learning group have been developed. These descriptive-analytical systems have been used in many educational disciplines, but very few attempts were made to apply them to physical education.

Those descriptive-analytical studies which have been completed in physical education represent the beginning of what appears to be a growing interest in this type of research, and further, they illustrate the broad range of research interests to be served. Other than Nygaard (1967), who applied the Flanders System of Interaction Analysis to forty physical education classes at different grade levels, researchers in physical education have developed their own observation systems.

Bookhout (1967) used descriptive-analytic procedures to determine the relationships between patterns of teacher behavior and social-emotional climate in physical education classes. Barrett (1969) developed a system for recording and describing teacher-student behavior in movement education classes. The system provides for the recording of the teacher's verbal behavior as well as the student's movement responses.

Wilson, Buzzel, and Jensen (1976) developed an observation instrument which had been designed specifically for physical education settings. It focuses upon the verbal feedback of physical education teachers. Fishman (1970) has also developed a system for recording augmented feedback provided by teachers in physical education classes. Schwartz (1972) proposed an observation schedule for use in physical education environments. The schedule was designed to assess the various components of an empirical model for teaching motor skills. However, it was limited to the analysis of verbal content.

Robbins (1973) developed an instrument to analyze the teacher verbal behavior in elementary school physical education. His research suggested that identification of common teacher behaviors in elementary school physical education would be of value in assessing physical education instruction in schools. More to the point of this study, an extension of Robbins' research would outline needed attempts to identify and determine coaching behaviors.

Rushall (1973c) mentions The Behavioral Observation Schedule for Pupils and Teachers (Breyer and Calchera, 1971) which extensively elaborates non-verbal behaviors, a number of which appear to Rushall to be appropriate for physical education and sport environments which he feels possess a greater importance on non-verbal behavior. A subset of the behavior categories of this schedule appeared to Rushall to have relevance for describing and analyzing the verbal and non-verbal behaviors of physical education teachers and coaches.

Analyses of Coaching Behavior in Sport

A behavior analysis model for training coaches does not imply a totally new concept for the field. However, it does imply a particular perspective from which to view content - and that perspective is on measurable and observable behavior. Siedentop (1972) feels that a behavior analysis model necessitates the recasting of educational goals in terms of behavior changes that can be measured. While this might well effect choice of content in the coaching development programs, it more directly bears on the process by which content is transmitted to the athlete. Though applied behavior analysis has only been recently used in physical education and sports, Rushall (1973b) claims the few isolated studies conducted by his students at Dalhousie University have been successful and have already started to attract attention.

Rushall (1973c) has developed an observation schedule for use in sporting and physical education environments. The Teacher/Coach Observation Schedule categorizes seven behaviors: 1) feedback and rewarding, 2) correcting and prohibiting, 3) questioning, 4) directing, explaining and informing, 5) monitoring and attending, 6) managing and 7) no activity. The category definitions are as follows:

Feedback: The coach provides information in order to tell the athlete that his/her performance was satisfactory and that he/she can continue further. The nature of the information is such that it indicates either of two things: 1) the performance was satisfactory and should be repeated in the same manner, or 2) the performance was satisfactory but can be improved even further by incorporating additional features which are included in the feedback communication. Feedback can concern both skill and general behaviors and must stipulate what to do on the next occurrence of the behavior.

Rewarding: The coach openly demonstrates pleasure with the behavior of an athlete, group, or team. It conveys a positive feeling about or acceptance of the behavior to which it is related. It can be verbal or non-verbal. The reward is differentiated from feedback in two ways: 1) it is purely directed at some past performance, and 2) the informational content does not indicate what to do on the next occurrence of the behavior.

Correcting: The coach provides information in order to tell the athlete that his/her performance was not satisfactory and how it must be altered to continue further. The content should include the performance characteristics which must be introduced to produce at least a satisfactory performance. This contrasts with feedback as correcting implies that the performer still has to achieve an adequate performance. Correcting can concern both skill and general behaviors and must stipulate what to do on the next occurrence of the behavior.

Prohibiting: The coach disciplines or openly displays displeasure with the behavior of an athlete, group, or team. It conveys a negative feeling about or unacceptability of the behavior to which it is related. It can be verbal or non-verbal. Prohibiting is differentiated from correcting in two ways, 1) it is purely directed at some past performance, and 2) the informational content does not indicate what to do on the next occurrence of the behavior.

Questioning: The coach asks a question related to the subject matter.

Directing: The coach directs an athlete, group, or team to do something directly related to the subject matter. The content does not refer to any previous behavior.

Explaining: The coach explains, elaborates, or summarizes previous material or paraphrases a statement that was not understood previously. The content must be related to the subject matter. This behavior is very noticeable when new information is being presented.

Informing: The coach answers an athlete's question: The question must be related to the subject matter.

Monitoring: The coach surveys the activity environment without focusing on a particular individual.

Attending: The coach listens or pays attention to what a student or group is doing or saying. The coach obviously focuses upon some activity or behavior.

Managing: The coach is engaged in behaviors which lead up to but are not directly related to a learning situation or the subject matter.

No activity: The coach is not engaged in verbal or non-verbal activity relevant to the class or subject matter. Generally, no interaction between the coach and athletes is evidenced.

In a study conducted to describe and evaluate leadership of minor hockey coaches, Danielson (1974) used Rushall's Dalhousie Coach Observation Schedule (DCOS) to obtain observational measures in game and practice situations. Specifically, he observed the rate of response to the seven behavioral categories during team practice. Danielson found that regarding the frequency of these behaviors, minor hockey coaches in both game and practice situations appeared to spend a great deal of time in "monitoring-attending" behaviors which led Danielson to conclude that the observed behaviors were found to be unrelated to coaching effectiveness.

Their research on educational method led Tharp and Gallimore (1976) to an interest in John Wooden, regarded by many as the greatest coach in the history of basketball. Clinical and educational psychology have increasingly relied on principles derived from laboratory research and then tested in the clinic and school, but seldom have psychologists actually studied in detail a master of teaching. This is possibly so because it is difficult to identify a true master in the ordinary classroom. However, Tharp and his associate felt that Wooden's coaching record of 10 national championships and fourteen conference championships qualified him as a master coach worthy of such study and analysis.

Tharp and Gallimore had intended to employ the standard-observation category system that they have used in school classrooms to do extensive research and teacher training, but once these ideas had been tested against the reality of coaching, two new categories were added to cover the coaching situation. A ten category observation schedule was then used to gather their data. The data gathered from fifteen practice sessions analyzed only the moves of Wooden - 2,326 acts of teaching over thirty hours, were recorded and classified in the ten categories. The category system, they claim was comprehensive in that a miscellaneous category, other, was used for only 2.4% of Wooden's teaching actions.

The behavior categories and definitions of Tharp and Gallimore's observation schedule are as follows:

Instructions: Verbal statements about what to do, or how to do it.

Hustles: Verbal statements to activate or intensify previously instructed behavior.

Modeling-positive: A demonstration of how to perform.

Modeling-negative: A demonstration of how not to perform.

Praises: Verbal compliments, encouragements.

Scolds: Verbal statements of displeasure.

Non-verbal reward: Nonverbal compliments or encouragements (smiles, pats, etc.)

Non-verbal punishment: Scowls and gestures of despair.

Scold/reinstruction: A combination category: a single verbal behavior which refers to a specific act, contains a clear scold, and reasserts a previously instructed behavior.

Other: Any behavior not falling into the above categories.

Uncodable: The behavior could not be clearly heard or seen.

CHAPTER III

METHODS AND PROCEDURE

Introduction

It has been claimed (Bijou et al, 1968; Hutt and Hutt, 1970) that progress in the behavioral sciences would be enhanced by more emphasis on descriptive studies. Probably the overwhelming reason for this apparent lack of interest in direct observation was the psychologist's need for scientific respectability. Tinbergen (cited in Hutt and Hutt, 1970) puts the case thus:

> It has been said that, in its haste to step into the twentieth century and to become a respectable science, Psychology skipped the preliminary descriptive stage that other natural sciences had gone through, and so was soon losing touch with the natural phenomena.

The noted behaviorist, John B. Watson, made a plea for observation in natural (non-laboratory) settings in his famous book, Psychology from the Standpoint of a Behaviorist:

> Everyone agrees that man's acts are determined by something, and that, whether he acts orderly or not, there are sufficient grounds for his acting as he does act, if only these grounds can be discovered. In order to formulate such laws, we must study man in action - his adjustments to the daily life situations which may confront him (1919, p. 1).

More recently, Berk and Adams (1970) have suggested that the investigator should be prepared to observe, unencumbered by his personal values and those of middle class society, the whole spectrum of human behavior from the most common to most deviant. Schwitzgebel and Kolb (1974) have stated that the accurate observation and recording of human behavior is essential if behavior is going to be understood and effectively changed. Behavior should be observed both in the experimental laboratory under special conditions and in natural, daily-life situations. The inadequacy of interview and questionnaire data regarding people's behavior (Skinner, 1969, p. 75) has been well documented and described by Schwitzgebel and Kolb. It is clear, therefore, that the observation of behavior is helpful, it not absolutely essential, for developing effective methods of behavior change, and that the resulting descriptive studies would reveal interesting relationships among the raw data that could provide provocative cues for experimental investigations.

In light of the above, and material presented in the earlier chapters, this study was a descriptive in depth case investigation employing applied behavior analysis techniques, that is, observation and measurement, to describe the coaching (instructional) behaviors of a varsity hockey coach.

The Subject

The subject for this study was Professor Clare Drake of the University of Alberta. Professor Drake has been the coach of the varsity hockey team for eighteen years during which time his teams have won 11 conference championships and two national championships. For a brief period Clare Drake coached both the varsity hockey and varsity football teams. In 1967 Drake coached both teams when they each won their respective national championships. Though it is difficult to define a "master" coach, Professor Drake was selected as the subject for this study because it was felt, that through his coaching experience and remarkable achievements during his tenure, he epitomized the master coach.

Drake had returned to the varsity team after a one year leave of absence. The significance of this statement for this study is that he was returning to an unfamiliar nucleus of players. Of those players who participated on the varsity hockey team during the 1976-77 season, coach Drake had had previous experience with just four. Eleven of the players were in their first year of varsity competition.

The University of Alberta hockey team captured the Canada West University Athletic Association league championship with a remarkable record of 21 wins and only three losses. In addition they won the conference championship and were finalists in the National championship game.

Development of Alberta Coach Observation Schedule (ACOS)

A coaching behavior observation schedule should ideally categorize all the coaching behaviors possible in a sporting environment. Some may view an observation schedule to be presumptuous for assuming that it identifies all possible coaching behaviors. The writer somewhat agrees with this view, but defends the use of an observation schedule for it acts as a point of reference from which behavior categories may be added or deleted according to the specific situation in which the schedule is being used.

The development of such a schedule for systematic behavioral analysis proceeds through a series of critical stages as outlined by Fishman and Anderson (1971) and modified by the writer for purposes of this study.

1. Selecting a Perspective

The first and most crucial decision to be made involved the selection of a perspective from which coaching events could be described. To record and classify everything that occurs in the sporting environment is obviously a futile task. Selecting a single perspective limited the focus of coaching observations and insured a more complete descriptive record of selected components of the coaching process. The perspective of this study was limited to the observation and analysis of the exhibited behaviors in an instructional (coaching) setting. The study did not look at dressing room or game-coaching behaviors.

2. Developing and Defining Categories

In developing a systematic procedure for describing events in coaching sessions, specific categories of behaviors within the perspective were identified and defined. The construction of categories was actually a way of assigning a name to a single behavior or to a group of related behaviors. The categories are mutually exclusive.

3. Determining Reliability and Objectivity

To determine the reliability and objectivity of the system, records made by trained observers were compared. The degree of reliability of recording a system was determined by computing the percentage of intra-observer agreement for each trained observer. Intra-observer agreement of 80% or better was considered acceptable (Rushall, 1973d).

The Alberta Coach Observation Schedule (ACOS), a result of combining and rearranging the Dalhousie Coach Observation Schedule (DCOS) (Rushall, 1973c) and Tharp and Gallimore's (1976) 10-category schedule, defines seven categories of coaching behavior. These two scales have been validated by their authors and contain behaviors identified as coaching behaviors. They, thus, represented a starting point for further identification, or omission, of such behaviors for this study and future research.

The function of ACOS during Phase I of the study was to act as a guide for the identification of coaching behaviors to be observed in this particular study. In addition to the nature and frequency of coaching behaviors, the sequences of behaviors, the conditions under which the behaviors occurred and the target to which the behaviors were directed, whether they be an individual, a group, or to the team as a whole, were also considered important to the coaching process.

The categories of the Alberta Coach Observation Schedule and the definitions for the sub-categories are outlined below.

BEHAVIOR CATEGORIES

1. Verbal Instruction (VI)

1.1 Directing (D)

The coach verbally directs an athlete, group, or team to do something directly related to the performance objectives of the activity.

Examples: Pass the puck; skate into the slot area.

1.2 Explaining (E)

The coach explains, elaborates or paraphrases previously stated material.

1.3 Informing (I)

The coach answers an athlete's question. The question must be related to the performance objectives of the activity.

1.4 Questioning (Q)

The coach asks a question related to the performance objectives of the activity.

1.5 Hustles (H)

The coach provides verbal statements intended to activate or intensify the present behavior of an athlete, group, or team. A hustle is in reality the coach shouting, "Drive! Drive! Harder! Faster! Hustle!"

Example: Come on guys, let's move faster out there. Come on ...faster, hustle!

2. Monitoring (M)

The coach surveys the activity environment without focusing on a particular individual.

3. Attending (A)

The coach looks at a speaking athlete or orientates to what an athlete, group, or team is doing. The coach obviously focuses visually upon some activity or behavior.

4. Performance Information (PI)

4.1 Praise (V+)

The coach verbally states his pleasure with the behavior of an athlete, group, or team. The statement conveys a positive feeling about or acceptance of the behavior to which it is related. The praise refers to some past performance and its informational content does not indicate what to do on the next occurrence of the behavior.

Example: That was a good practice. You put lots of effort into it.

4.2 Non-Verbal Reward (NV+)

The coach non-verbally demonstrates his pleasure with the behavior of an athlete, group, or team. The coach's behavior conveys a positive feeling about or acceptance of the behavior displayed by the athlete(s). The non-verbal compliment is directed at some past performance.

Example: The coach gives a victory sign with his fingers.

4.3 Scold (S)

The coach verbally states his displeasure with the behavior of an athlete, group, or team. The statement conveys a negative feeling about or unacceptance of the behavior to which it is related. The scold refers to some past performance and its informational content does not indicate what to do on the next occurrence of the behavior.

Example: That was a poor shot.

4.4 Non-Verbal Punishment (NV-)

The coach non-verbally demonstrates his displeasure with the behavior of an athlete, group, or team. The coach's behavior conveys a negative feeling about or unacceptance of the behavior displayed by the athlete(s). The non-verbal punishment is directed at some past performance.

4.5 Scold-Reinstruct (S-R)

A combination category: the coach performs a verbal behavior which refers to a specific past behavior on the part of an athlete, group, or team, containing a clear scold, and reasserts a previously instructed behavior.

Example: No! You don't do that. I've told you many times that you must look up when you come out of your end and you swing out with the puck.

4.6 Feedback (F)

The coach provides information in order to tell the athlete that his/her performance was satisfactory and that he can continue further. The nature of the information is such that it indicates either of two things:

1) the performance was satisfactory and should be repeated in the same manner, or,

2) the performance was satisfactory but can be improved even further by incorporating additional features which are included in the feedback communication.

4.7 Correcting (C)

The coach provides information in order to tell the athlete that his/her performance was not satisfactory and how it must be altered to continue further. Correcting differs from scold-reinstruction in that it does not contain a clear scold. The informational content of the correcting statement should include the performance characteristics which must be introduced to produce at least a satisfactory performance. Correcting implies that the performer still has to achieve an adequate performance. The correcting statement must stipulate what to do on the next occurrence of the behavior.

Example: Instead of passing the puck to the blue line, pass the puck into the slot area next time you are in that situation.

5. Skill Demonstration (SD)

5.1 Modelling$^+$ (M$^+$)

The coach demonstrates to an athlete, group, or team how a skill should be performed.

5.2 Modelling - (M-)

The coach demonstrates to an athlete, group, or team how not to perform a skill.

5.3 Modex+ (M+)

A combination category: the coach concurrently demonstrates and explains a skill behavior to an athlete, group, or team.

Example: Notice that when I squeeze the player into the board, I do not go past him and allow him to get to the blueline before I do.

5.4 Modex- (Mo-)

A combination category: the coach concurrently demonstrates and explains the wrong way to perform a skill behavior to an athlete, group, or team.

6. Managing (Ma)

The coach is engaged in behaviors which lead up to the performance objectives of the activity.

Examples: Placing pylons on the ice; moving goals; reading coaching notes.

7. Miscellaneous (Misc)

7.1 No activity (N)

The coach is not involved in verbal or non-verbal activity relevant to the practice. Generally, no interaction between the coach and athletes is evidenced.

Example: Not being present in the environment.

7.2 Other (O)

Any behavior not falling into the above categories.

7.3 Uncodable (X)

The behavior could not be clearly heard or seen due to audio or video malfunction.

PRACTICE PHASES

Structure of coaching environment

1. Exercise (E)

Athletes are engaging in activities which are generally designed to improve their skill and tactical understanding.

2. Transition (T)

Athletes are passing from one stage of the practice to another.

3. Lecture (L)

Coach presents material to the team either at the bench (using chalkboard) or when they are stationary on the ice surface.

4. Warm-Up (W)

Athletes are engaging in activities which generally promote the body's physiological adaptability for the task at hand.

Example: light skating and stretching exercises.

5. Fitness (F)

Athletes are engaging in activities which are generally designed to improve their endurance, strength, speed, and flexibility capabilities.

6. Intra-Squad Game (I-G)

Athletes are engaging in an intra-squad game which is under the control of the coach.

BEHAVIOR DIRECTION

1. Individual (I)

The coach verbally or non-verbally interacts with an individual athlete.

2. Group (G)

The coach verbally or non-verbally interacts with a particular group of athletes but not the whole team.

Example: Defencemen come over here.

3. Team (T)

The coach verbally or non-verbally interacts with all the team members present.

Example: Everybody skate to the far end.

4. Alone (A)

The coach engages in a verbal or non-verbal behavior without the immediate presence of others.

Example: Moves a goal from one position to another without the assistance of others.

5. Auxillary Personnel (AP)

The coach verbally or non-verbally interacts with one or more of the following: assistance coach, team manager(s), team trainer(s).

PHASE I

Preliminary Investigation

The behavioral scientist, beginning his study, requires a preparatory period of acquaintance with his subject of study. Furthermore, it was necessary during this period of time to develop a method of recording which was systematic and reliable.

From this preliminary investigation the author was able to confirm and derive new definitions of the behavioral sub-categories and stimulus events from the actual setting. The pilot investigation was used to provide preliminary information on the frequencies of occurrences of the events of interest and feasibility of the situation for the study. It also allowed the coach to become habituated to the presence of an outsider. Wright (1960) comments that one cannot entirely stop being himself for long because he is being watched. Forces of life settings may always be stronger than induced forces of a detached onlooker.

Phase I of the study enabled the researcher to determine the conclusiveness of ACOS in its ability to collect coaching behaviors. Immediately after every preliminary observation period the appropriateness of ACOS sub-categories were evaluated to determine whether they accurately described the behaviors and situations illustrated on the video tape.

The preliminary investigation allowed for the training of the two observers to be finalized. This period of time was also valuable in determining the performance capabilities of the equipment and the most suitable equipment location for data collection.

Observer Training and Agreement

The observers were able to recite the behavior categories, their subclassifications, and explain the category definitions prior to Phase I.

During Phase I, the trainee observers identified and discussed the behaviors they observed on the video tape recordings. The training was simplified by the advantages gained through the use of such a technological tool, a VTR, which could gather stabilized records of the coaching process which could then be studied at the convenience of the observers.

It was much easier to generate observer agreements from the recordings since the events of coaching were repeatedly examined and even the most complex judgment were made with assurance by the observers. During the two week training period agreement measures were taken.

The method of establishing observer agreement was for the two observers to make simultaneous, independent observations of the same environment. The percentage of agreement between the observers was considered the agreement measure. Inter-observer agreement was calculated as follows:

$$\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ Agreement}$$

Equipment and Equipment Location

The data was collected on video tape recordings using a solid state Sanyo ½" video tape recorder (VTR) Model 2000. The video input was supplied by a Panasonic camera equipped with a UHF cable and a zoom lens. The lens was opened to its widest angle to facilitate the gathering of data. The aperture was set at 1.5.

The coach's verbal behaviors were collected through the employment of a small and portable wireless microphone and FM receiver. The microphone was attached to the lapel of the coach's training suit. A small, Phillips-made, transmitter sat snugly in a pocket. The verbal behaviors were transmitted through the FM receiver to the VTR where they were fed on to the tape. A 23" Setchell Carlson monitor was utilized to observe the recordings.

After a few preliminary trials it was decided to place the equipment in a location which afforded the widest angle possible. The position selected, at the highest possible point in the seating area of the arena, and located in a proximity to the "center-ice," afforded a very good view.

PHASE II

Data Collection and Analysis Procedures

Direct Observation

The conjunction of description and science will be an anathema to many experimental psychologists, but Hutt and Hutt (1970) maintain that for certain problems (and for the study of certain subjects) direct observation of the free behavior of the organism is the method par excellence. It is the study of spontaneous and ongoing behavior in the settings of everyday life.

This procedure for collecting data has been a methodological mainstay in many other sciences. It has stood as the basic method of astronomy and the earth sciences, of the natural history disciplines in biology, and of anthropology and sociology. Pure observational methods have enabled scientists to record the true appearance and the distribution of countless phenomena, and to discover new things from micro-organisms to galaxies.

According to Wright (1960), observational study may need nothing more than a basic unit of description that 1) can be used in the field, 2) takes in a diversity of behavior and situation variables, 3) has psychological integrity, 4) has clear meaning in terms of some central criterion, and 5) permits study of behavior in context.

Data Collection

The collection of data involved two steps:

1. Recording
2. Encoding

The principal concern of data collection was perceived to be the obtaining of valid empirical information. To avoid behavior inference, recall, or incorrect categorization, an observation procedure was used to analyze the ongoing behavior of the subject within the coaching environment. Final data collection began when it was evident that the observer was adequately trained, the field situation was feasible, and the coach had adapted to the presence of the observer and equipment.

A trained observer utilizing explicitly defined behavior categories assessed the frequency and occurrence of the defined categories of behavior from video tape recordings.

Recording Procedure

Video taping has been described by Hutt and Hutt (1970) as an excellent means of obtaining long, continuous records of behavior sequences. Video tape can capture and preserve indefinitely all there is to see and hear of a behavior sequence and its immediate conditions. The recorded actions and situations can be observed and analyzed for as long and often as patience lasts. Behavior is hard to study partly because it happens so fast; it comes and goes before one can get a good look at it from even a single point of view. Video tapes can make everyday behavior open to prolonged and intensive observation and study

Wright (1960) reports a study conducted by Bernhardt, Millichamp, Charles, and McFarland in 1937 which used a silent movie camera and paired observers to simultaneously record each subject's behavior. Wright notes that perhaps the most noteworthy finding of their study now is that the number of observed contacts was increased approximately 70%, by addition of film records, over what was seen in the field. The coaching sessions were observed in their entirety.

Encoding Procedure

To avoid missing behavioral events while analyzing the video tapes, the observer relayed his observations from the video tape recordings to an audio tape. Next, the data was recorded onto the data sheets while listening to the audio tape. This procedure allowed event sampling to be more accurate and efficient. For each coaching session the data sheets were totalled and then transferred to a master sheet.

Event Sampling

Data was gathered by recording unitary behavioral events as they happened, one by one, in the naturally occurring behavior streams; and it is submitted that these data, for the study of integral behavioral events of a given class, are intelligible and useful.

Perhaps the most distinctive good point of event sampling is that it structures the field of observation into natural units of behavior and situation (Wright, 1960), and allows a fair chance to study relationships between behavior and its co-existing conditions.

Data Analysis

The data analysis began when data collection for each session ended. By converting frequency counts into tabular form, the data analysis shows the relationships among the variables of the study. Data collected in terms of rate are usually plotted in graphic form. The measure of frequency is preferable to that of duration, intensity, and latency for several reasons (Skinner, 1953). First, this measure readily shows changes over short and long periods of observations. Second, it specifies the amount of behavior displayed (Honig, 1966). Finally, and perhaps most important, it is applicable to operant behaviors. Hutt and Hutt (1970) advise that it would be unwise to discount as unimportant, behaviors with a low frequency. In terms of the situational effects of the behaviors they may contain considerably more information than more frequently occurring items.

The graphic presentations are made more meaningful through the accompaniment of percentage values in the tables. In addition, the percentages of occurrence in the different conditions of the field situation are shown.

A method of assessing patterns of behavior involves the recording of the sequence of occurrence of the behavior categories. For example, when an attending behavior is consistently followed by a reward and the provision of feedback, and then a further attending behavior, an intrinsic individual behavior pattern is exhibited.

The coaching behaviors were further illuminated by examining the antecedent and subsequent behaviors. The convention of entering consecutive pairs of tallies into matrix cells facilitated this.

D)
(D
A)
(D
A)
V+

The first tally of each pair indicates the matrix row, while the second indicates the column. Thus to examine the events that precede any given category of behavior, one goes to the column of that category and examines each cell in that column in turn. Similarly, by examining any given row, cell by cell, we can determine the frequencies of behaviors that followed the display of behavior in that category.

The sequences of behaviors are paired in order of their occurrence and each pair appears as a tally in the corresponding cell in a matrix. Except for the first and last behavior, each behavior appears in two successive pairs, first as the second behavior of a pair, then as the first behavior of the next pair. The matrix row is indicated by the first behavior of each pair and the matrix column by the second behavior in each pair. This procedure preserves some aspects of the sequence of recorded events when the linear tabulations are displayed as a matrix.

Data Treatment

The purpose of this study was to identify and describe coaching behaviors that were observed and measured (frequency) in an instructional (coaching) setting. The study focused upon the following questions:

1. What are the predominant coaching behaviors exhibited by the subject coach?
2. Are these coaching behaviors consistent throughout the season?
3. Can behavior sequences be identified?

To determine which of the observed coaching behaviors were predominant, the frequency counts of the categories and sub-categories were totalled and percentage values calculated.

Seasonal and practice variables were selected to determine the consistency of the behavior. The season variables were Early-, Mid-, and Late-season. The practice variables were Mid-Week (MW), Pre-Game (PreG), and Post-Game (PoG). The variables provided a 9-cell matrix.

The category totals from each of the coaching session master sheets were then placed within the appropriate cells. Due to the variation of the number of sessions for each cell (Table 1), mean scores were derived. These scores were then transposed into percentage values.

TABLE I

Distribution of Coaching Sessions

	MW	ProG	PoG	Total
Early	5	4	3	12
Mid	3	3	3	9
Late	1	4	4	9
Total	9	11	10	30

Matrices were developed for each major category to illustrate the frequency and percentage value for each cell, for example, the frequency of Verbal Instruction during the PoG practices in the Early-season. The values are presented in tabular and graphic form.

The data was treated further to identify relationships (frequency and percentage) of each Behavior category to the Behavior Direction (BD) and the Practice Phase (PP) categories. That is, to whom and during what practice phase was the behavior expressed. Major relationships between these categories were determined.

The final step was the identification of the major behavior sequences based on the total behaviors observed over the entire season. The procedure, outlined earlier, placed consecutive pairs of tallies into matrix cells.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

From his behavioral observational research on physical education teachers, Robbins (1973) recommended that future research in this area focus upon, among other things, the consistency of behavior over time, and the patterns of exhibited behavior. Early-, mid-, and late-season variables were employed to determine whether the subject coach exhibited behaviors that were consistent over time. The variables of Mid-Week (MW), Pre-Game (PreG), and Post-Game (PoG) were also selected to see whether there was a relationship between the time-of-the-week of the practices and regular season contests which were played on weekends. The behaviors exhibited during each practice were recorded on the data sheets in such a way as to preserve the original sequence.

The data collected consisted of pre-determined behaviorally defined events for each practice session observed. The observation and measurement was not limited to behaviors, but extended to show to whom the behavior was directed and during what particular phase of the practice session.

Data Analysis

The analysis of data consisted of the following procedures:

1. Inter-observer agreement checks were made to establish if two observers, making simultaneous, independent observations of the same environment, had attained a consensus in excess of 80%.
2. The data recorded on the practice observation forms (Appendix A) was tabulated on a daily session master sheet (Appendix B) and then transferred to one of the three master sheets (Appendices C, D, and E). Each of these master sheets represented a season variable. From the matrices representing the various categories, frequency sub-totals, means and percentages were determined. From the matrices of the various categories, the percentages, which represent the proportion of each behavior category compared to the total behaviors, were then recorded on graphs to illustrate relationships between the selected variables.
3. The series of behavioral events were paired in order of their occurrence and each pair appears as a tally in the corresponding cell in the matrix. The tallies for categories 1 to 6, from each observation period, were transferred to a master sheet. The totals for those behavior categories were then placed in a master matrix from which sequential patterns of behavior were identified. (See Table 78 on page 137.)

I. RESULTS

Inter-Observer Agreement

During the preliminary investigative stage inter-observer agreement across the sub-categories of behavior was achieved. The percentages of agreement reached 88% and 92%.

Grand Total Behaviors

During the thirty observation periods (38 hours), a total of 17,379 behavioral events were recorded. The sub-totals of each seasonal and practice variables are summarized in Table 2. The number in each cell represents the total frequency of behaviors that occurred for that particular relationship. For example, 3523 behaviors were recorded during the Early-season, Mid-Week practices.

TABLE 2

Summary of Grand Total Behaviors

	MW	PreG	PoG	Total		%
Early	3523	2188	1240	6951	579.3	33.3
Mid	1705	2119	1862	5686	631.8	36.4
Late	499	2283	1959	4742	526.9	30.3
Total	5727	6590	5061	17379	1738	
	636.3	599.1	506.1	1741.5		
%	36.5	34.4	29.1			100.0

Because of the variation in terms of the number of practices occurring in each cell, mean scores were derived. The percentage figures represent 1) the proportion of that behavior throughout the season, and 2) the proportion of that behavior from practice to practice.

The percentages outlined in Table 2 show that although there was a fluctuation between the Early- (33.3%), Mid- (36.4%), and Late-season (30.3%), it was, however, slight. The results of the data tend to indicate that the frequency of coaching behavior was fairly consistent over the course of the season. The proportion of the total frequency of the coach's behavior for the practice variables were Mid-Week (MW) (36.5%), Pre-Game (PreG) (34.4%), and Post-Game (P9G) (29.1%).

Behavior Categories

The categorical distribution of coaching behavior for the entire season is illustrated in Table 3. The Verbal Instruction category accounted for 49.6% of the total behavioral events. The Monitoring and Attending categories accounted for 8.1% and 25.6% respectively. The number of behavioral events defined as Performance Information totalled 12.0%. Closer inspection of Performance Information reveals that Positive Evaluation behaviors (Praise and Non-Verbal Reward) represent 7.3% of the total behaviors. Behaviors classified as Negative Evaluation (Scold, Non-verbal Punishment and Scold-Reinstruction) equalled 2.5%. Feedback and Correcting made up just .4% and 1.8% respectively of the total behaviors. Skill Demonstration 1.2% , Managing 1.6%, and Miscellaneous

1.9% accounted for the remainder.

TABLE 3

Distribution of the Total Coaching Behaviors

Category			%
1.	Verbal Instruction		49.6
	Directing	35.2	
	Explaining	6.7	
	Informing	1.8	
	Questioning	3.0	
	Hustles	2.9	
2.	Monitoring		8.1
3.	Attending		25.6
4.	Performance Information		12.0
	Praise	7.2	
	Non-Verbal Reward	.1	
	Scold	2.0	
	Non-Verbal Punishment	.1	
	Scold-Reinstruct	.4	
	Feedback	.4	
	Correcting	1.8	
5.	Skill Demonstration		1.2
	Modelling$^+$	.04	
	Modelling$^-$	.01	
	Modex$^+$	1.0	
	Modex$^-$	.1	
6.	Managing		1.6
7.	Miscellaneous		1.9
Total			100.0

1. Verbal Instruction

Table 4 indicates that the decrease in the frequency of Verbal Instruction over the course of the season was less than 5%. The fluctuation between the practice variables followed a similar pattern.

TABLE 4

Distribution of Verbal Instruction Behavior
for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	1786	1178	670	3634	302	35.3
Mid	793	1013	825	2631	292	34.2
Late	226	1135	990	2351	261	30.5
Total	2805	3326	2485	8616	855	
	311.7	302.4	248.5	862.6		
%	36.1	35.1	28.8			100.0

A comparison of the frequency of Verbal Instruction to the total number of behaviors for each cell is shown in Table 5. For example Verbal Instruction accounted for 50.7% of all behaviors that occurred in the Early-MW cell.

TABLE 5

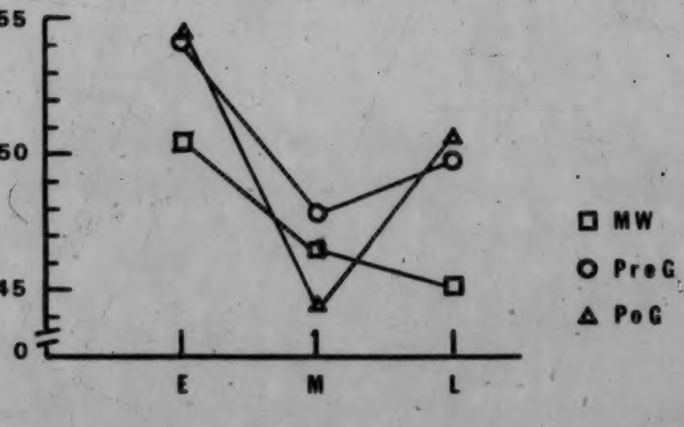
Distribution of Verbal Instruction Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	50.7	53.9	54.1
Mid	46.5	47.8	44.3
Late	45.3	49.7	50.6

Figure 1 illustrates that Verbal Instruction was higher for each of the practice variables during the Early-season. Following decreases from 4.2% (MW) to 9.8% (PoG) during the Mid-Season, each practice variable, with the exception of Mid-week, showed an increase during the Late-season. An increase was most notable for the Post-Game sessions.

FIGURE 1

Distribution of Verbal Instruction for the Practice and Season Variables



1.1 Verbal Instruction Sub-Categories

The frequencies of the sub-categories; Directing (D), Explaining (E), Informing (I), Questioning (Q), and Hustles (H) for the season variables are shown in Table 6. As one can see in the table, Directing was by far the most frequent (70.9%) of all Verbal Instruction behaviors. In fact, Directing behaviors, telling athletes to do something, accounted for 35.2% of the total behaviors in the observation schedule.

TABLE 6

Distribution of the Sub-Categories of Verbal Instruction Behavior for each Seasonal Variable

	Early	Mid	Late	Total	%*	%**
Directing	2533	1887	1693	6113	70.9	35.2
Explaining	479	320	360	1159	13.5	6.7
Informing	157	104	61	322	3.7	1.8
Questioning	207	174	143	524	6.1	3.0
Hustles	258	146	94	498	5.8	2.9
Total	3634	2631	2351	8616	100.0	49.6

* Represents the distribution of the sub-categories.

** % of Total Behavior categories

1.11 Directing (D)

Table 7 indicates that the decrease (3.8%) in the frequency of Directing Behaviors during the season was similar to, and followed the same pattern as its parent category (VI). This is to be expected in light of the data presented above. However, the distribution of Directing throughout the seasonal variables indicates that the use of this behavior by the coach was consistent. The percentages of Directing behaviors occurring in Mid-week and Pre-Game were very similar. Pre-Game practices had a higher proportion of behaviors exhibited during the Exercise phase of the practices.

TABLE 7

Distribution of Directing Behavior for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	1195	864	474	2533	211.1	34.7
Mid	569	741	577	1887	209.7	34.4
Late	174	869	650	1695	188.1	30.9
Total	1938	2474	1701	6113	608.9	
	215.3	224.9	170.1	610.3		
%	35.3	36.8	27.9			100.0

Figure 2 is derived from the percentages shown in Table 8. Directing behaviors occur more frequently, over the course of the season, during Pre-game practices. With the exception of the interchange between Mid-Week and Post-Game during the Early-season, Directing behavior appears to show some consistency.

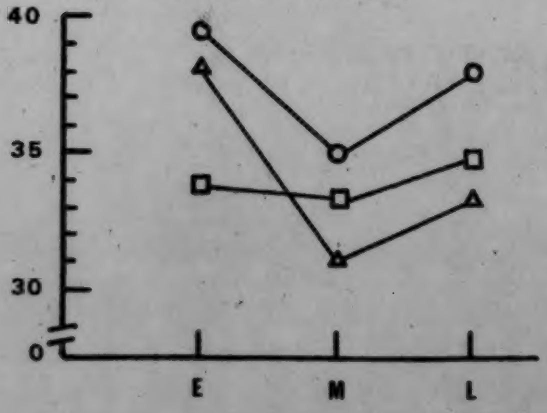
TABLE 8

Distribution of Directing Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	33.9	39.5	38.2
Mid	33.4	35.0	31.0
Late	34.9	38.1	33.2

FIGURE 2

Distribution of Directing for the Practice and Season Variables



1.2 Relationship Between Direction of Verbal Instruction Behavior and the Specific Phase of the Practice

The following two tables illustrate to whom the sub-categories of Verbal Instruction were directed (Table 9), and during which phase of the practice, (Table 10) for the total season.

Forty-two point four percent of Verbal Instruction was directed toward the Group. Directing behavior accounted for 34.5% of all Verbal Instruction received by the Group. Individuals received 27.5 % while 26.2% was directed toward the Team as a whole. A great deal of the Exercise phase of the practices was conducted with small groups of two or more players, depending on the activity. This reason, and the fact that Drake used an assistant coach, explains the large proportion of Verbal Instruction behaviors that were directed toward the Behavior Direction category classified as the Group.

TABLE 9

Summary of Behavior Direction for Verbal Instruction Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
Directing	1616	26.4	2969	48.6	1460	23.9			68	1.1
Explaining	124	10.7	327	28.2	652	56.3			56	4.8
Informing	185	57.5	14	4.3	20	6.2			103	32.0
Questioning	190	36.3	149	28.4	72	13.7	2		111	21.2
Hustles	253	50.8	192	38.6	53	10.6				
Total	2368		3651		2257		2		338	
%	27.5		42.4		26.2		.02		3.9	

TABLE 10

Summary of Practice Phase in Which Verbal Instruction Behaviors Were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
D	2997	49.0	1590	26.0	382	6.2	220	3.6	334	5.5	590	9.7
E	256	22.1	224	19.3	556	48.0	25	2.2	14	1.2	84	7.2
I	121	37.6	77	23.9	57	17.7	38	11.8	10	3.1	19	5.9
Q	207	39.5	74	14.1	109	20.8	58	11.1	17	3.2	59	11.3
H	200	40.2	22	4.4	2	.4	3	.6	226	45.4	45	9.0
Total	3781.		1987		1106		344		601		797	
%	43.9		23.1		12.8		4.0		7.0		9.2	

Exercise was that phase of the practice in which 43.9% of all Verbal Instruction was exhibited. Verbal Instruction during Transition accounted for 23.1%. The values for the remaining phases are shown in Table 10.

1.21 In dealing with the sub-categories we observe some notable relationships. During the course of the season, 48.6% of all Directing behavior was received by the Group. Individuals received 26.4% of all Directing behavior while the Team received 23.9%. Directing behavior generally occurred during Exercise (49.0%) and Transition (26.0%). Most of all Directing behavior was directed to the Group during Exercise.

Explaining behavior was mostly directed toward the Team (56.3%), followed by the Group (28.2%) and Individual (10.7%). Informing behavior, however, was primarily directed toward the Individual (57.5%) and the Auxillary Personnel (32.0%). As one might expect Explaining behavior was primarily directed during the Lecture phase (48.0%). However, Exercise (22.1%) and Transition (19.3%) account for over 40%. Most explaining took place when the coach was addressing the team in a Lecture situation. Over 60% of Informing took place during Exercise (37.6%) and Transition (23.9%).

Questioning behavior was more evenly divided; Individual (36.3%), Group (28.4%), and Auxillary Personnel (21.2%). Hustles were divided as follows: Individual (50.8%), Group (38.6%), and Team (10.6%). Questioning behavior occurred mainly during Exercise (39.5%) and Lecture (20.8%). Another 25% of Questioning took place during Transition (14.1%) and Warm-up (11.1%).

Over 50% of the Hustles were directed toward the Individual (50.8%) usually during Fitness (45.4%) and Exercise (40.2%).

Tables 11 to 16 illustrate the Behavior Direction (BD) and Practice Phase (PP) relationship for each of the three season variables.

In summarizing Tables 11, 13, and 15 it can be stated that the Behavior Direction of Verbal Instruction was fairly stable through the Early-, Mid-, and Late-season variables, and, in addition, the percentage totals for each season variable closely resembled the Total season pattern illustrated in Table 9.

Tables 12, 14, and 16 show discernable fluctuations occurring in the Practice Phase categories. One does not need to explain these changes because differences in the practice structure in each of the seasonal variables are a result of the specific needs of the team. The Practice Phases are not a result of the Behaviors.

2. Monitoring (M)

Table 17 shows that there was a dramatic increase, almost 100% in the frequency of Monitoring behavior from the Early- (22.9%) to Mid-season (43.8%). During the Late-season (33.3%) the frequency decreased. The frequency for the practice variables was somewhat stable (Mid-Week at 36.2% and Pre-Game at 35.4%).

TABLE 11

Early-Season Summary of the Behavior Direction for Verbal Instruction Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
Directing	629	24.9	1295	51.1	581	22.9			28	1.1
Explaining	33	6.9	130	27.1	299	62.4			17	3.5
Informing	85	54.1	9	5.7	15	9.6			48	30.6
Questioning	75	36.2	66	31.9	33	15.9	2	1.0	31	15.0
Hustles	106	41.1	133	51.6	19	7.4				
Total	928		1633		947		2		124	
%	25.5		44.9		26.1		.1		3.4	

TABLE 12

Early-Season Summary of Practice Phase in Which Verbal Instruction Sub-Categories Were Displayed

	E		T		L		W		F		G	
	f	%	f	%	f	%	f	%	f	%	f	%
Directing	1459	57.7	537	21.2	186	7.3	72	2.8	103	4.1	176	6.9
Explaining	104	21.7	80	16.7	258	53.9	4	.8	2	.4	31	6.5
Informing	59	37.6	31	19.7	40	25.5	13	8.3	6	3.8	8	53.1
Questioning	74	35.7	29	14.0	64	30.9	9	4.3	7	3.4	24	11.6
Hustles	122	47.3	11	4.3			1	.4	100	38.8	24	9.3
Total	1818		688		548		99		218		263	
%	50.1		18.9		15.1		2.7		6.0		7.2	

TABLE 13

Mid-Season Summary of the Behavior Direction for Verbal Instruction Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
D	474	25.1	864	45.8	518	27.5			31	1.6
E	33	10.3	90	28.1	173	54.1			24	7.5
I	56	53.8	4	3.9	3	2.9			41	39.4
Q	60	34.5	31	17.8	20	11.5			63	36.2
H	91	62.3	37	25.4	18	12.3				
Total	714		1026		732				159	
%	27.1		39.0		27.8				6.1	

TABLE 14

Mid-Season Summary of Practice Phase in Which Verbal Instruction Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
D	816	43.3	608	32.2	73	3.9	78	4.1	104	5.5	208	11.0
E	61	19.1	82	25.6	123	38.4	10	3.1	8	2.5	36	11.3
I	38	36.5	26	25.0	7	6.7	19	18.3	4	3.9	10	9.6
Q	69	39.7	25	14.4	16	9.2	35	20.1	7	4.0	22	12.6
H	58	39.7	8	5.5	1	.7	2	1.4	64	43.8	13	8.9
Total	1042		749		220		144		187		289	
%	39.6		28.5		8.3		5.5		7.1		11.0	

TABLE 15

Late-Season Summary of the Behavior Direction for Verbal Instruction Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
D	513	30.3	810	47.9	361	21.3			9	.5
E	58	16.1	107	29.7	180	50.0			15	4.2
I	44	72.1	1	1.6	2	3.3			14	23.0
Q	55	38.4	52	36.4	19	13.3			17	11.9
H	56	59.6	22	23.4	16	17.0				
Total	726		992		578				55	
%	30.9		42.2		24.6				2.3	

TABLE 16

Late-Season Summary of Practice Phase in Which Verbal Instruction Sub-Categories Were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
D	722	42.6	445	26.3	123	7.3	70	4.1	127	7.5	206	12.2
E	91	25.3	62	17.2	175	48.6	11	3.1	4	1.1	17	4.7
I	24	39.4	20	32.8	10	16.4	6	9.8			1	1.6
Q	64	44.7	20	14.0	29	20.3	14	9.8	3	2.1	13	9.1
H	20	21.3	3	3.2	1	1.1			62	66.0	8	8.5
Total	921		550		338		101		196		245	
%	39.2		23.4		14.4		4.3		8.3		10.4	

TABLE 17

Distribution of Monitoring Behavior for Each Seasonal and Practice Variable

	MW	PreG	PoG	Total		T
Early	186	116	96	398	33.2	22.9
Mid	188	191	194	573	63.7	43.8
Late	31	213	192	436	48.4	33.3
Total	405	520	482	1407	145.3	
	45.0	47.3	48.2	140.5		
%	32.0	33.7	34.3			100.0

However, when we look at Table 18 and Figure 3, which the percentages of Monitoring behavior compared to all the behavior categories, we note that Post-Game practices, with one exception (Mid-Week, Mid-Season), display a higher incidence of Monitoring behavior. Monitoring behavior appears to have increased in frequency during the second stage of the season and then generally stabilized.

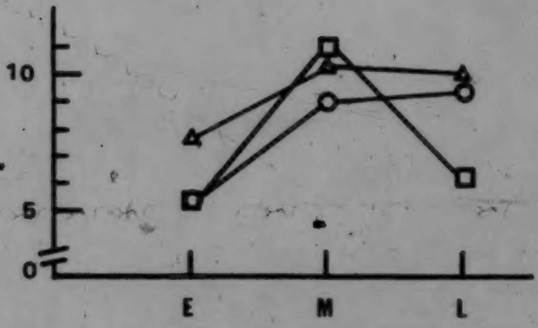
TABLE 18

Distribution of Monitoring Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	5.3	5.3	7.7
Mid	11.0	9.0	10.4
Late	6.2	9.3	9.8

FIGURE 3

Distribution of Monitoring for the Practice and Season Variables



2.1 Relationship Between Direction of Monitoring Behavior and the Specific Phase of the Practice

The following two tables illustrate to whom the monitoring behavior was directed (Table 19) and during which phase of the practice (Table 20) for the total season.

From Table 19 it is noted that Monitoring behavior was primarily directed toward the Team (83.2%). Table 20 indicates that close to 70% of Monitoring behavior occurred during the Transition (34.1%) and Exercise (32.8%) phases.

3. Attending (A)

Attending behavior appears to have been fairly stable during the course of the season (Table 21). There was a slight increase during the Mid-season with a corresponding decrease during the Late-season. Constancy of Attending behavior was also indicated for the practice variables, but there was a decline of Attending behavior in Post-Game practices. As a proportion of the total behaviors, Attending recorded its lowest frequency in Early-season, Post-Game practices during which time Verbal Instruction was at its highest.

Table 22 and Figure 4 also indicate the consistency of Attending behavior. With the exception of the Mid-Week, Late-season practices, the range of variation is approximately 5%.

TABLE 19

Summary of the Behavior Direction for Monitoring Behavior

	I		G'		T		A		AP	
	F	%	f	%	f	%	f	%	f	%
Early			66	4.7	332	23.6				
Mid	1	.05	81	5.8	491	34.9				
Late	1	.05	88	6.2	347	24.7				
Total	2		235		1170					
%	.1		16.7		83.2					

TABLE 20

Summary of Practice Phase in Which Monitoring Behavior was Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
Early	146	10.4	127	9.0			70	5.0	46	3.3	9	.6
Mid	204	14.5	198	14.1			103	7.3	56	4.0	12	.9
Late	111	7.9	155	11.0	1	.07	89	6.3	75	5.3	5	.3
Total	461		480		1		262		177		26	
%	32.8		34.1		.07		18.6		12.6		1.8	

TABLE 21

Distribution of Attending Behavior for Each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	871	573	282	1726	143.8	32.2
Mid	424	551	497	1472	163.6	36.7
Late	154	612	484	1250	138.9	31.1
Total	1449	1736	1263	4448	446.3	
	161	157.8	126.3	445.1		
%	36.2	35.4	28.4			100.0

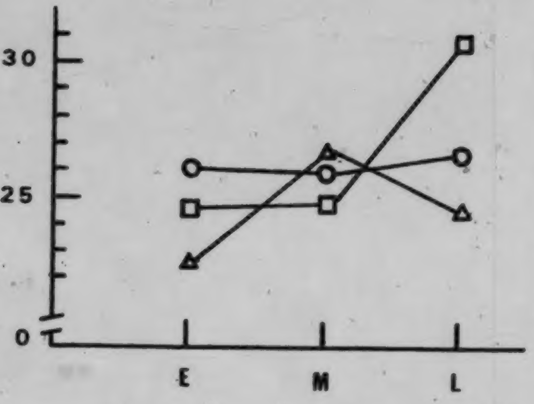
TABLE 22

Distribution of Attending Behavior as a Proportion of the Total Behaviors (in percentages)

	MW	PreG	PoG
Early	24.7	26.2	22.7
Mid	24.9	26.0	26.7
Late	30.9	26.8	24.7

FIGURE 4

Distribution of Attending for the Practice and Season Variables



3.1 Relationship Between Direction of Attending Behavior and the Specific Phase of the Practice

The following two tables illustrate to whom the Attending behavior was directed (Table 23) and during which phase of the practice (Table 24) for the total season.

By far the largest amount of Attending behavior was directed toward the Group (75.6%). The Attending behavior usually occurred during Exercise (68.8%).

TABLE 23

Summary of the Behavior Direction for Attending Behavior

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
Early	239	5.4	1247	28.1	143	3.2			97	2.2
Mid	172	3.9	1063	23.9	141	3.2			96	2.2
Late	132	2.9	1051	23.6	33	.7			34	.7
Total	543		3361		317				227	
%	12.2		75.6		7.1				5.1	

TABLE 24

Summary of Practice Phase in Which Attending Behavior was Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
Early	1230	27.6	95	2.1	114	2.5	28	.6	70	1.6	189	4.3
Mid	988	22.2	70	1.6	29	.7	61	1.4	47	1.0	277	6.2
Late	843	19.0	60	1.4	30	.7	24	.5	58	1.3	235	5.3
Total	3061		225		173		113		175		701	
%	68.8		5.1		3.9		2.5		3.9		15.8	

4. Performance Information (PI)

The utilization of Performance Information climbed to a peak during the Mid-season (41.5%), only to diminish in the final third of the season to 26.8%. (Table 25). There was also a discernible decrease in the frequency of Performance Information from a Mid-Week (42.2%) high to Pre-Game (30.7%), and a further curtailment of over 3% for Post-Game (27.1%) practices (Table 25).

TABLE 25

Distribution of Performance Information Behavior for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	482	205	108	795	66.3	31.7
Mid	251	258	272	781	86.8	41.5
Late	65	248	190	503	55.9	26.8
Total	798	711	570	2079	209.	
	88.7	64.6	57.0	210.3		
%	42.2	30.7	27.1			100.0

Table 26 and Figure 5 indicate a fairly consistent pattern of occurrences of Performance Information for the season variables. The only exception to the pattern is the definite increase of Performance Information occurrences in the Post-Game practices during Mid-season.

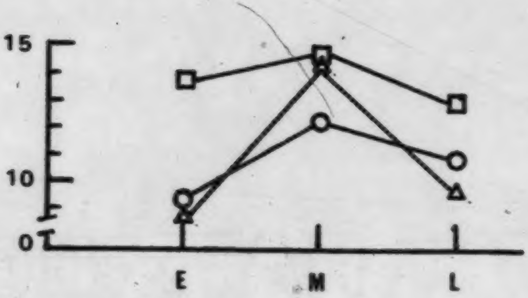
TABLE 26

Distribution of Performance Information as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	13.7	9.4	8.7
Mid	14.7	12.2	14.6
Late	13.0	10.9	9.7

FIGURE 5

Distribution of Performance Information for the Practice and Season Variables



4.1 Performance Information Sub-Categories

The frequencies of the sub-categories, Praise (V+), Non-Verbal Reward (NV+), Scold (S), Non-Verbal Punishment (NV-), Scold-Reinstruction (S-R), Feedback (F), and Correcting (C) for the season variables are illustrated in Table 27. The table indicates that V+ (60.2%) behavior was the most frequent of all Performance Information behaviors.

TABLE 27

Distribution of the Sub-Categories of Performance Information Behavior for Each Seasonal Variable

	Early	Mid	Late		%*	%**
Praise	426	508	318	1252	60.2	7.2
NV+	7	12	7	26	1.3	.1
					61.5	
Scold	212	64	70	346	16.6	2.0
NV-	1	2	11	14	.7	.1
S-R	43	13	11	67	3.2	.4
					20.5	
Feedback	24	24	15	63	3.0	.4
Correcting	82	158	71	311	15.0	1.8
					18.0	
Total	795	781	503	2079	100.0	12.0

* Represents the distribution of the sub-categories

** Percentage of Total Behavior categories.

4.11 Positive Evaluation Behaviors (V+ and NV+)

Table 28 illustrates a dramatic increment in behaviors during the Mid-season (44.4%). The remaining 55.6% of positive evaluation behaviors was equally divided among Early- and Late-season.

Mid-Week (46.0%) practices accounted for the largest proportion of these behaviors. There was a sharp decrease in positive evaluation from Mid-Week to Pre-Game (31.6%) which continued to Post-Game (22.4%).

TABLE 28

Distribution of Positive Evaluation Behavior for Each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	320	85	28	435	36.1	27.8
Mid	180	179	161	520	57.8	44.4
Late	36	187	102	325	36.1	27.8
Total	536	451	291	1278	13.0	
	59.6	41.0	29.1	129.7		
%	46.0	31.6	22.4			100.0

Table 29 and Figure 6 point out a similar pattern occurring within the practice variables throughout the season.

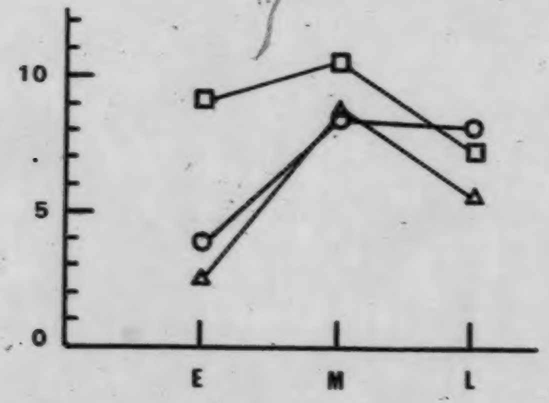
TABLE 29

Distribution of Positive Evaluation Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	9.1	3.9	2.3
Mid	10.5	8.4	8.7
Late	7.2	8.2	5.3

FIGURE 6

Distribution of Positive Evaluation for the Practice and Season Variables



4.12 Negative Evaluation Behaviors (S, NV- and S-R)

The use of negative evaluation as a mode of Performance Information occurred most frequently during the Early-season (52.9%). The rate abated to 21.8% in Mid-season and rose slightly in Late-season (25.3%).

TABLE 30

Distribution of Negative Evaluation Behavior for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	107	89	60	256	21.3	52.9
Mid	23	28	28	79	8.8	21.8
Late	13	39	40	92	10.2	25.3
Total	143	156	128	427	40.3	
	15.9	14.2	12.8	42.9		
%	37.1	33.1	29.8			100.0

Table 31 and Figure 7 show quite well the consistency of the low frequency of negative evaluation in Mid-season. Negative evaluation occurring in the Mid-Week practices was lower than the other two practice variables in both the Early- and Mid-season. However, during the Late-season it was higher. In the final phase of the season, the negative evaluation occurred less in the Pre-Game practices.

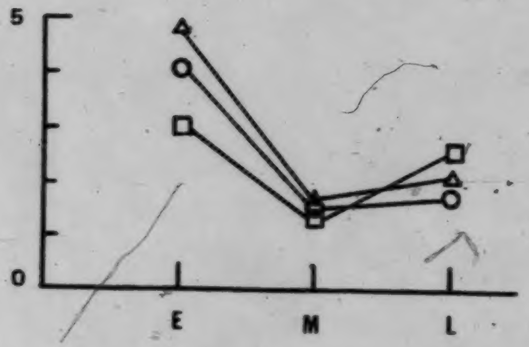
TABLE 31

Distribution of Negative Evaluation Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	3.0	4.1	4.8
Mid	1.3	1.4	1.5
Late	2.6	1.7	2.0

FIGURE 7

Distribution of Negative Evaluation for the Practice and Season Variables



4.13 Feedback and Correcting Behaviors (F & C)

Feedback and Correcting behaviors more than doubled in their frequency of occurrence in Mid-season (52.3%) compared to Early- (22.8%) and Late-season (24.9%) (Table 32). These behaviors occurred most often in Post-Game (40.0%) practices. Slightly more than a third of Feedback and Correcting behaviors were observed during Mid-week (34.9%). Pre-Game practices attributed 25.1% (Table 32).

TABLE 32

Distribution of Feedback and Correcting Behaviors for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	55	31	20	106	8.8	22.8
Mid	48	51	83	182	20.2	52.3
Late	16	22	48	86	8.6	24.9
Total	119	104	151	374	38.6	
	13.2	9.5	15.1	37.8		
%	34.9	25.1	40.0			100.0

Except for the increasing frequency of Feedback and Correcting in Mid-Week practices through the course of the season, the inter-variable relationship followed a similar pattern (Table 33 and Figure 8).

TABLE 33

Distribution of Feedback and Correcting Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	1.6	1.4	1.6
Mid	2.8	2.4	4.4
Late	3.2	.9	2.5

FIGURE 8

Distribution of Feedback and Correcting for the Practice and Season Variables

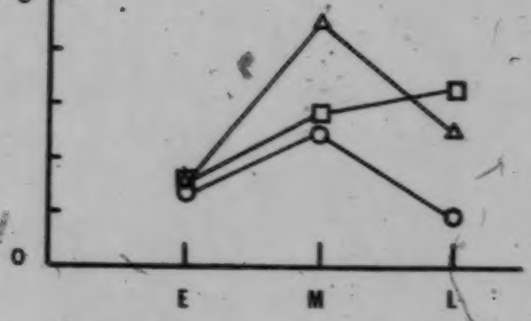
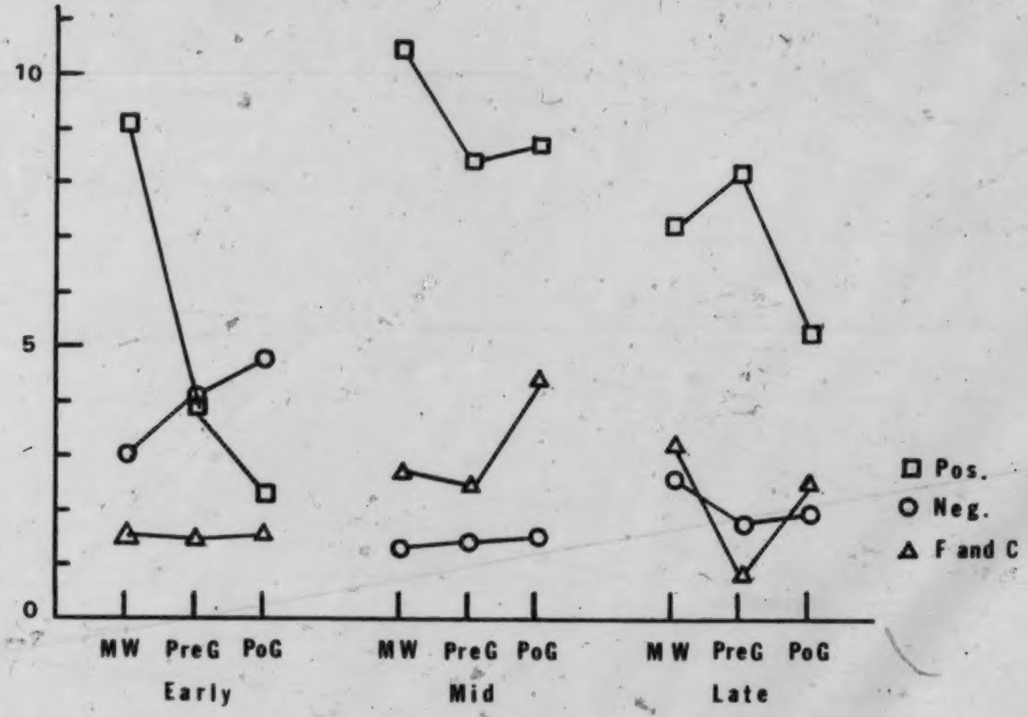


Figure 9 illustrates the relationship between the three intermediate categories of Performance Information.

FIGURE 9
Relationship of Intermediate Performance Information Categories



4.2 Relationship Between Direction of Performance Information Behaviors and the Specific Phase of the Practice

The following two tables reveal to whom the Performance Information behaviors were directed (Table 34) and during which phase of the practice (Table 35) for the total season.

TABLE 34

Summary of the Behavior Direction for Performance Information Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
V+	713	57.0	460	36.7	78	6.2			1	.1
NV+	19	73.1	7	26.9						
S	247	71.4	88	25.4	11	3.2				
NV-	5	35.7	9	64.3						
S-R	49	73.1	14	20.9	4	6.0				
F	39	61.9	22	34.9	2	3.2				
C	247	79.4	51	16.4	13	4.2				
Total	1319		651		108				1	
%	63.4		31.3		5.2					.05

TABLE 35

Summary of Practice Phase in Which Performance Information Sub-Categories were Displayed

	E		T		L		W		F		IG	
	f	%	f	%	f	%	f	%	f	%	f	%
V+	754	60.2	34	2.7	59	4.7	6	.5	84	6.7	315	25.2
NV+	17	65.4									9	34.6
S	259	74.9	2	.6	2	.6	11	3.1	31	9.0	41	11.8
NV-	12	85.7									2	14.3
S-R	52	77.6	2	3.0	1	1.5	2	3.0	2	3.0	8	11.9
F	51	81.0	1	1.6	5	7.9					6	9.5
C	250	80.4	2	.6	3	1.0	11	3.5	14	4.5	31	10.0
Total	1395		41		70		30		131		412	
%	67.1		2.0		3.4		1.4		6.3		19.8	

Nearly two-thirds of the Performance Information behaviors that occurred throughout the whole season were directed toward the Individual (63.4%). The Group accounted for 31.3% (Table 34). Performance Information occurred most frequently in the Exercise (67.1%) and Intra-team Game (19.8%) phases (Table 35).

4.21 Relationship Between Direction of Performance Information Sub-Categories and the Specific Phase of the Practice

In dealing with the Performance Information sub-categories we can observe some notable relationships. During the entire season, 57.0% of all Praise behavior was conducted toward the Individuals, and 36.7% toward the Group. Praise behavior mostly occurred during Exercise (60.2%) and Intra-team Game (25.2%). Seventy-three percent of Non-Verbal Reward was directed toward the Individual and during Exercise (65.4%).

Scold behavior was primarily aimed at the Individual (71.4%) and the Group (25.4%). It occurred the most, by far, in Exercise (74.9%). Non-Verbal Punishment behavior was mostly received by the Group (64.3%) during Exercise (85.7%). Like Scold, Scold-Reinstruct behavior was also directed, most of all, toward the Individual (73.1%) while in Exercise (77.6%).

Feedback (61.9%) and Correcting (79.4%) behaviors also followed the basic pattern of the parent category in that they were bound for the Individual (81.0%) in the Exercise (80.4%) Phase.

Tables 36 - 41 illustrate the Behavior Direction and Practice Phase relationship for each of these three season variables.

TABLE 36

Early-Season Summary of the Behavior Direction for Performance Information Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
V+	203	47.7	198	46.5	24	5.6			1	.2
NV+	3	42.8	4	57.2						
S	149	70.3	57	26.9	6	2.8				
NV-			1	100.0						
S-R	31	72.1	9	20.9	3	7.0				
F	15	62.5	8	33.3	1	4.2				
C	63	76.8	15	18.3	4	4.9				
Total	464		292		38				1	
%	58.5		36.7		4.7				.1	

TABLE 37

Early-Season Summary of Practice Phase in Which Performance Information Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
V+	257	60.3	7	1.6	17	4.0	4	.9	42	9.9	99	23.2
NV+	3	42.9									4	57.1
S	163	76.9	1	.5	2	.9	1	.5	24	11.3	21	9.9
NV-	1	100.0										
S-R	33	76.7	1	2.3	1	2.3	2	4.7	2	4.7	4	9.3
F	20	83.3			4	16.7						
C	78	95.0					2	2.5			2	2.5
Total	555		9		24		9		68		130	
%	69.8		1.1		3.0		1.1		8.6		16.4	

TABLE 38

Mid-Season Summary of the Behavior Direction for Performance Information Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
V+	317	62.4	161	31.7	30	5.9				
NV+	9	75.0	3	25.0						
S	46	71.9	16	25.0	2	3.1				
NV-			2	100.0						
S-R	10	77.0	2	15.3	1	7.7				
F	14	58.3	10	41.7						
C	127	80.4	25	15.8	6	3.8				
Total	523		219		39					
%	67.0		28.0		5.0					

TABLE 39

Mid-Season Summary of Practice Phase in Which Performance Information Sub-Categories Were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
V+	315	62.0	14	2.8	20	3.9	1	.2	36	7.1	122	24.0
NV+	8	66.7									4	33.3
S	49	76.6	1	1.5			4	6.3	1	1.5	9	14.1
NV-	1	50.0									1	50.0
S-R	11	84.6	1	7.7							1	7.7
F	19	79.2	1	4.2							4	16.6
C	125	79.1	1	.7			6	3.8	10	6.3	16	10.1
Total	528		18		20		11		47		157	
%	67.6		2.3		2.6		1.4		6.0		20.1	

TABLE 40

Late-Season Summary of the Behavior Direction for Performance Information Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
V+	193	60.7	101	31.8	24	7.5				
NV+	7	100.								
S	52	74.3	15	21.4	3	4.3				
NV-	5	45.5	6	54.5						
S-R	8	72.7	3	27.3						
F	10	66.6	4	26.7	1	6.7				
C	57	80.3	11	15.5	3	4.2				
Total	332		140		31					
%	66.0		27.8		6.2					

TABLE 41

Late-Season Summary of Practice Phase in Which Performance Information Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
V+	182	57.2	13	4.1	22	6.9	1	.3	6	1.9	94	29.6
NV+	6	85.7									1	14.3
S	47	67.1					6	8.6	6	8.6	11	15.7
NV-	10	91.0									1	9.0
S-R	8	72.7									3	27.3
F	12	80.0			1	6.7					2	13.3
C	47	66.2	1	1.4	3	4.2	3	4.2	4	5.6	13	18.4
Total	312		14		26		10		16		125	
%	62.0		2.8		5.2		2.0		3.2		24.8	

In summarizing Tables 36, 38, and 40, it can be seen that the directionality of Performance Information was fairly stable through the Early-, Mid-, and Late-season variables. Additionally, the percentage total for each season variable closely resembled the total season pattern (Table 34 on page 90).

5. Skill Demonstration (SD)

The frequency of Skill Demonstration diminished over the season from a high of 42.1% in the Early-season to a low of 24.9% in the Late-season (Table 42). The Post-Game practices (40.4%) recorded the highest frequency of Skill Demonstration (Table 42).

TABLE 42

Distribution of Skill Demonstration Behavior for Each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	47	34	24	105	8.8	42.1
Mid	8	23	31	62	6.9	33.0
Late	5	10	32	47	5.2	24.9
Total	60	67	87	214	20.9	
	6.7	6.1	8.7	21.5		
%	31.2	28.4	40.4			100.0

Table 43 shows that there was a very limited range of variation of Skill Demonstration behavior between the season and practice variables.

TABLE 43

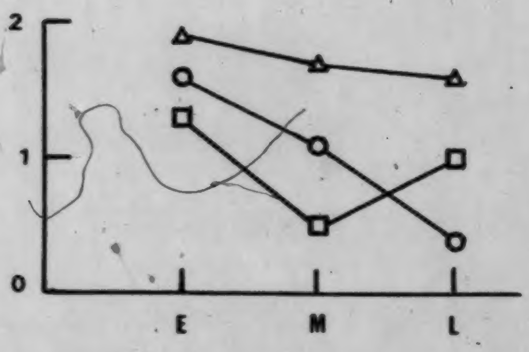
Distribution of Skill Demonstration Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	1.3	1.6	1.9
Mid	.5	1.1	1.7
Late	1.0	.4	1.6

Figure 10 illustrates similar patterns for the practice variables throughout the season. The exception is the increase of Skill Demonstration behavior in the Mid-Week practice in the Late-season.

FIGURE 10

Distribution of Skill Demonstration for the Practice Season Variables



5.1 Skill Demonstration Sub-Categories (M^+, M^-, Mo^+, Mo^-)

Table 44 indicates that the Modex (Mo^+, and Mo^-) behaviors accounted for over 97% of Skill Demonstration behaviors.

TABLE 44

Distribution of the Sub-Categories of Skill Demonstration Behavior for each Seasonal Variable

	Early	Mid	Late	Total	%*	%**
Modelling$^+$	2	3		5	2.3	.04
Modelling$^-$	1			1	.5	.01
Modex$^+$	91	48	43	182	85.0	1.0
Modex$^-$	11	11	4	26	12.2	.1
Total	105	62	47	214	100.0	1.2

* Represents the distribution of the sub-categories.

** % of Total Behavior Categories.

5.2 Relationship Between Direction of Skill Demonstration Behavior and the Specific Phase of the Practice

The two attendant tables define the direction (Table 45) and the specific phase of the practice (Table 46) of Skill Demonstration behavior for the total season.

TABLE 45

Summary of the Behavior Direction for Skill Demonstration Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
M+			1	20.0	4	80.0				
M-					1	100.0				
Mo+	11	6.0	42	23.1	129	70.9				
Mo-	2	7.7	2	7.7	22	84.6				
Total	13		45		156					
%	6.1		21.0		72.9					

TABLE 46

Summary of Practice Phase in which Skill Demonstration Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f1	%	f	%	f	%	f	%	f	%
M+	1	20.0			4	80.0						
M-					1	100.0						
Mo+	22	12.1	6	3.3	145	79.7	1.	.5	1	.5	7	3.9
Mo-	2	7.7	1	3.8	22	84.6					1	3.8
Total	25		7		172		1		1		8	
%	11.7		3.3		80.4		.5		.5		3.7	

Close to 75% of Skill Demonstration was directed toward the Team (72.9%). Skill Demonstration during Lecture occurred 80.4%.

Tables 47 – 52 show the Behavior Direction and Practice Phase relationship for each of the season's three variables.

TABLE 47

Early-Season Summary of the Behavior Direction for Skill Demonstration Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
M+					2	100.				
M-					1	100.				
Mo+	3	3.3	14	15.4	74	81.3				
Mo-			1	9.1	10	90.9				
Total	3		15		87					
%	2.9		14.3		82.8					

TABLE 48

Early-Season Summary of Practice Phase in which Skill Demonstration Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
M+					2	100.						
M-					1	100.						
Mo+	7	7.7	2	2.2	79	86.8	1	1.1			2	2.2
Mo-	1	9.1			10	90.9						
Total	8		2		92		1				2	
%	7.6		1.9		87.6		1.0				1.9	

TABLE 49

Mid-Season Summary of the Behavior Direction for Skill Demonstration Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
M+			1	33.3	2	66.7				
M-										
Mo+	3	6.3	21	43.7	24	50.0				
Mo-	2	18.2	1	9.1	8	72.7				
Total	5		23		34					
%	8.1		37.1		54.8					

TABLE 50

Mid-Season Summary of Practice Phase in Which Skill Demonstration Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
M+	1	33.3			2	66.7						
M-												
Mo+	8	16.7	4	8.3	32	66.7					4	8.3
Mo-	1	9.1			9	81.8					1	9.1
Total	10		4		43						5	
%	16.1		6.5		69.4						8.0	

TABLE 51

Late-Season Summary of the Behavior Direction for Skill Demonstration Sub-Categories

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
M+										
M-										
Mo+	5	11.6	7	16.3	31	72.1				
Mo-					4	100.0				
Total	5		7		35					
%	10.6		14.9		74.5					

TABLE 52

Late-Season Summary of Practice Phase in Which Skill Demonstration Sub-Categories were Displayed

	E		T		L		W		F		1G	
	f	%	f	%	f	%	f	%	f	%	f	%
M+												
M-												
Mo+	7	16.3			34	79.1			1	2.3	1	2.3
Mo-			1	25.0	3	75.0						
Total	7		1		37				1		1	
%	15.0		2.1		78.7				2.1		2.1	

6. Managing (Ma)

As the season progressed the frequency of Managing behavior decreased from an Early-season high of 43.9% to 29.3% in Mid-season. A further decrease occurred in Late-season (26.8%). (Table 53.) It is also evident from the table that the percentage values for the practice variables were fairly stable, though Mid-Week (36.8%) was higher.

TABLE 53

Distribution of Managing Behavior for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	67	43	32	142	11.8	43.9
Mid	20	22	29	71	7.9	29.3
Late	6	29	30	65	7.2	26.8
Total	93	94	91	278	26.9	
	10.3	8.6	9.1	28		
%	36.8	30.7	32.5			100.0

Table 54 and Figure 11 infer fairly consistent patterns across the seasonal variables for each of the practice variables.

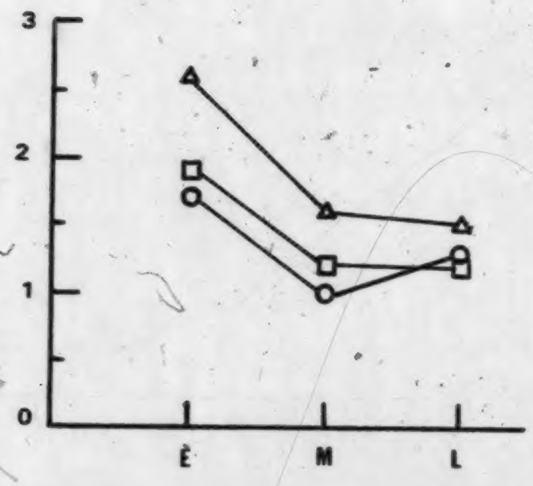
TABLE 54

Distribution of Managing Behavior as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early 1	1.9	1.7	2.6
Mid	1.2	1.0	1.6
Late	1.2	1.3	1.5

FIGURE 11

Distribution of Managing for the Practice and Season Variables



6.1 Relationship Between Direction of Managing Behavior and the Specific Phase of the Practice

The following two tables indicate to whom the Managing behavior was directed (Table 55) and in which practice phase (Table 56) for the total season.

The Managing behavior was usually conducted Alone (94.6%), separate from the athletes, during Exercise (48.2%) and Transition (32.7%) (Table 56).

7. Miscellaneous (Misc)

Table 57 shows the frequency of occurrence of Miscellaneous behavior.

TABLE 55

Summary of the Behavior Direction for Managing Behavior

	I		G		T		A		AP	
	f	%	f	%	f	%	f	%	f	%
Early	1	.7	8	5.6	[illegible]	.7	132	93.0		
Mid					2	2.8	69	97.2		
Late	2	3.7	1	1.5			62	95.4		
Total	3		9		3		263			
%	1.1		3.2		1.1		94.6			

TABLE 56

Summary of Practice Phase in which Managing Behavior was Displayed

	E		T		L		W		F		IG	
	f	%	f	%	f	%	f	%	f	%	f	%
Early	63	44.4	47	33.1	1	.7	11	7.7	13	9.2	7	4.9
Mid	39	54.9	18	25.4			13	18.3	1	1.4		
Late	32	49.2	26	40.0			6	9.2	1	1.5		
Total	134		91		1		30		15		7	
%	48.2		32.7		.4		10.8		5.4		2.5	

TABLE 57

Distribution of Miscellaneous Behavior for Each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	84	39	28	151	12.6	38.0
Mid	21	61	14	96	10.7	32.2
Late	12	36	41	89	9.9	29.8
Total	117	136	83	336	33.2	
	13.0	12.4	8.3	33.7		
%	38.6	36.8	24.6			100.0

Behavior Direction Categories

The following data results refer more specifically to the directionality of the behavior categories. For the total season, behavior directed toward the Individual athlete accounted for 24.7%, Group (46.6%), Team (23.5%) and Auxillary Personnel (3.5%). Behavior exhibited while the coach was apart from the athletes, or Alone, made up the remaining 1.7%.

1. Individual

Behavavior intended for the Individual expanded during the Mid-season to 37.1% from the Early-season (31.8%). However, there was an equivalent reduction during the Late-season (31.1%). Table 58 also shows that behavior directed towards the Individual was less during Post-Game practices (28.4%) than for Mid-Week (36.3%) and Pre-Game (35.3%).

TABLE 58

Distribution of Behavior Directed Toward the Individual for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	856	521	268	1645	137.1	31.8
Mid	437	582	417	1436	159.6	37.1
Late	111	562	533	1206	134.0	31.1
Total	1404	1665	1218	4287	430.7	
	156.	151.4	121.8	429.2		
%	36.3	35.3	23.4			100.0

Table 59 corroborates a directional consistency. The values in the table represent the percentage of the grand total of behavioral units. Figure 12 illustrates that as the season progressed, especially into the Late-season, behavior directed toward the Individual, in Post-Game practices, increased.

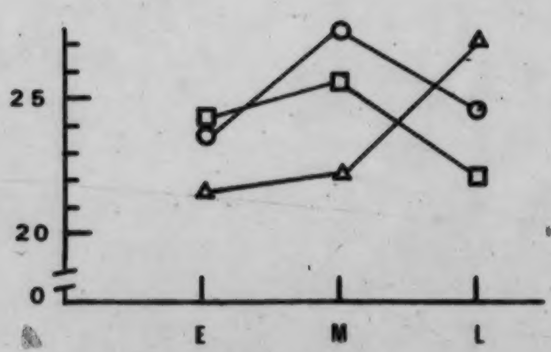
TABLE 59

Distribution of Behavior Directed Toward Individual as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	24.3	23.8	21.6
Mid	25.6	27.5	22.4
Late	22.2	24.6	27.2

FIGURE 12

Distribution of Behavior Directed Toward Individual for the Practice and Season Variables



2. Group

The stability of exhibited behavior to the Group through the entire season is demonstrated in Table 60. During Post-Game practices, this behavior direction decreased to 25.8% from a high of 37.9% in Mid-Week and 36.3% in Pre-Game.

TABLE 60

Distribution of Behavior Directed Toward Group for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	1685	1124	523	3332	277.7	34.4
Mid	804	951	691	2446	271.8	33.6
Late	280	1166	881	2327	258.6	32.0
Total	2769	3241	2095	8105	808.1	
	307.7	294.6	209.5	811.8		
%	37.9	36.3	25.8			100.0

In Table 61 and Figure 13 we can observe similar patterns occurring for each of the practice variables. Behaviors directed to the Group increased to their highest values for all practice variables in the Late-season.

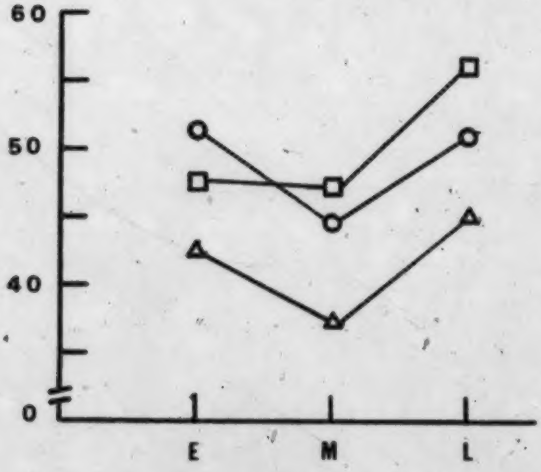
TABLE 61

Distribution of Behavior Directed Toward Group as a Proportion of the Total Behaviors
(in Percentages)

	MW	PreG	PoG
Early	47.8	51.4	42.2
Mid	47.2	44.9	37.1
Late	56.1	51.1	45.0

FIGURE 13

Distribution of Behavior Directed Toward Group for the Practice and Season Variables



3. Team

Behavior directed toward the Team increased in the Mid-season to 39.8% from the Early-season (31.8%). These behaviors diminished in the Late-season to 28.4%. These values are presented in Table 62. It is evident from the data that the frequency of behavior received by the Team was fairly stable relative to the practice variables. However, there was a slight decrease noticed during Pre-Game practices.

TABLE 62

Distribution of Behavior Directed Toward Team for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	793	434	341	1568	130.7	31.8
Mid	387	469	616	1472	163.6	39.8
Late	96	480	472	1048	116.4	28.4
Total	1276	1383	1429	4088	410.7	
	141.8	125.7	142.9	410.4		
%	34.6	30.6	34.8			100.0

Through the course of the season, behavior aimed at the Team was higher in Post-Game practices. Mid-Week and Pre-Game practices were constant. All practice variables showed some decrease in the Late-season (Table 63 and Figure 14).

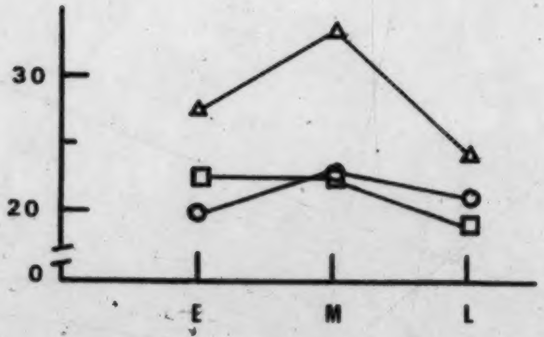
TABLE 63

Distribution of Behavior Directed Toward Team as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	22.5	19.8	27.5
Mid	22.7	22.1	33.1
Late	19.2	21.0	24.1

FIGURE 14

Distribution of Behavior Directed Toward Team for the Practice and Season Variables



4. Alone

The relationship between the Managing behavior category and the Alone category was established earlier in the analysis of Managing behavior. The tabular and graphical representations for these two categories are almost identical and hence will not be duplicated here.

5. Auxillary Personnel

Table 64 vividly portrays the distinct frequency changes for the season's three variables. Of all behaviors directed toward Auxillary Personnel, 35.4% occurred during the Early-season. The frequency peaked in Mid-season (46.9%) and then declined dramatically to 17.7% in Late-season. Most behaviors directed toward the Auxillary Personnel occurred during Post-Game practices (37.2%), however, the differences appear to be slight.

TABLE 64

Distribution of Behavior Directed Toward Auxillary Personnel for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	117	66	74	257	21.4	35.4
Mid	55	93	108	256	28.4	46.9
Late	6	45	45	96	10.7	17.7
Total	178	204	227	609	60.5	
	19.8	18.5	22.7	61.		
%	32.5	30.3	37.2			100.0

Behavior directed toward Auxillary Personnel accounted for only a small portion of the total behaviors (Table 65). Figure 15 illustrates a consistent pattern between the three practice variables.

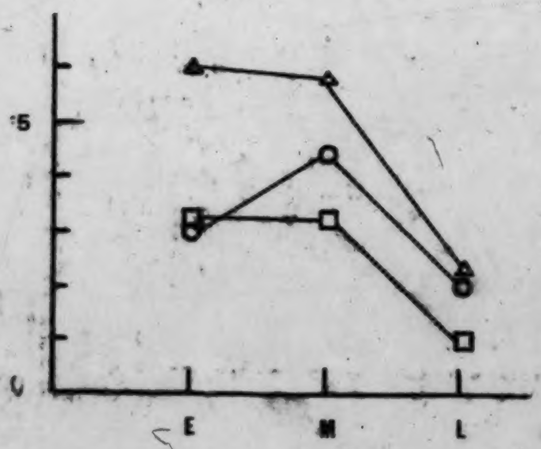
TABLE 65

Distribution of Behavior Directed Toward
Auxillary Personnel as a Proportion of the Total Behaviors
(in Percentages)

	MW	PreG	PoG
Early	3.3	3.0	6.0
Mid	3.2	4.4	5.8
Late	1.2	2.0	2.3

FIGURE 15

Distribution of Behavior Directed Toward Auxillary Personnel
for the Practice and Season Variables



Practice Phase Categories

The remaining tables and graphs indicate the frequency of behavior occurring in the particular phases of the practice. It is not the behaviors that elicit the frequencies of the practice phases.

1. Exercise

Thirty-six point two percent of behaviors occurring in the Exercise phase occurred during the Early-season, Mid- and Late-season tallied 35.6% and 28.2% respectively (Table 66). Pre-Game practices (38.2%) had the highest value, compared to Mid-Week (31.5%) and Post-Game (30.3%), of the total behaviors exhibited in Exercise.

TABLE 66

Distribution of Behavior Displayed in Exercise for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	1658	1474	777	3904	325.3	36.2
Mid	757	1104	1014	2875	319.4	35.6
Late	138	1202	940	2280	253.3	28.2
Total	2548	3780	2731	9059	898	
	283.1	343.6	273.1	899.8		
%	31.5	38.2	30.3			100.0

The following table and graph illustrate the percentages of the behaviors occurring during Exercise in comparison to the total behaviors for the whole season (Table 67). Figure 16 indicates a similar trend for all three practice variables across the three variables for the season with the exception of Pre-Game practices in Mid-season.

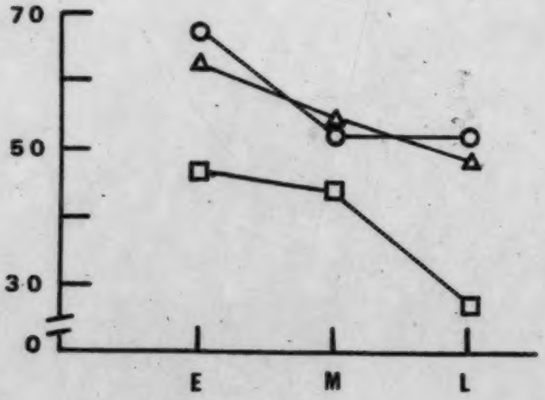
TABLE 67

Distribution of Behavior Displayed in Exercise
as a Proportion of the Total Behaviors
(in Percentages)

	MW	PreG	PoG
Early	47.1	67.4	62.7
Mid	44.4	52.1	54.5
Late	27.7	52.7	48.0

FIGURE 16

Distribution of Behaviors Displayed in Exercise for the Practice and Season Variables



2. Transition

Of the season's total behaviors exhibited in the transition phase of the practices, 40.8% occurred in Mid-season (Table 68). Of the season's total, the breakdown for the practice variables is: Mid-Week (33.4%), Pre-Game (37.4%), and Post-Game (29.2%).

TABLE 68

Distribution of Behavior Displayed in Transition for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	508	348	130	986	82.2	28.2
Mid	278	420	369	1067	118.6	40.8
Late	73	405	333	812	90.2	31.0
Total	859	1174	832	2865	291	
	95.4	106.7	83.2	285.3		
%	33.4	37.4	29.2			100.0

The following table and graph depict the percentages of the behaviors occurring in Transition, compared to the total behaviors for the whole season (Table 69). Figure 17 shows a similar trend for all three practice variables across the three variables of the season, however, Post-Game practices did show a marked increment during Mid-season.

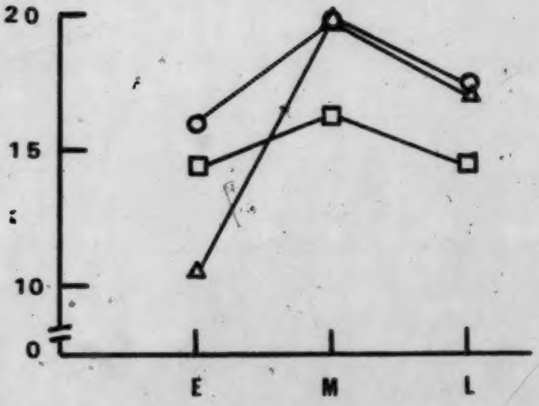
TABLE 69

Distribution of Behavior Displayed in Transition
as a Proportion of the Total Behaviors
(in Percentages)

	MW	PreG	PoG
Early	14.4	15.9	10.5
Mid	16.3	19.8	19.8
Late	14.6	17.7	17.0

FIGURE 17

Distribution of Behavior Displayed in Transition for the
Practice and Season Variables



3. Lecture

Of the season's total behaviors displayed in the Lecture phase of the practices, 44.2% happened in the Early-season (Table 70).

TABLE 70

Distribution of Behavior Displayed in Lecture for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	408	218	165	791	65.9	44.2
Mid	63	103	147	313	34.8	23.3
Late	23	153	260	436	48.4	32.5
Total	494	474	572	1540	149.1	
	54.9	43.1	57.2	155.2		
%	35.4	27.8	36.8			100.0

The next table and graph depict the frequency of behaviors occurring during Lecture, in contrast to the total behaviors, for the entire season (Table 71). Figure 18 expresses a similar trend for all three practice variables, however, Post-Game practices had a marked increment in the Late-season.

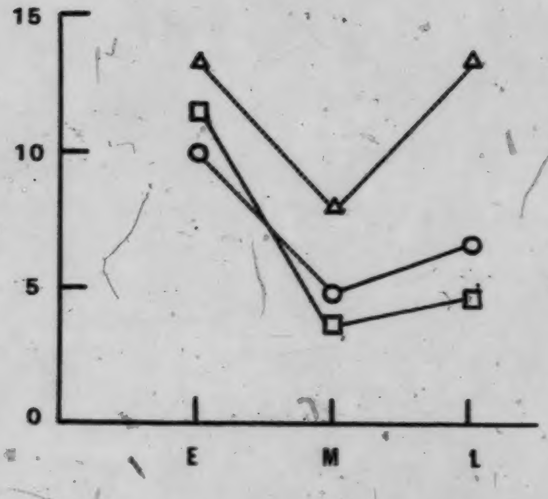
TABLE 71

Distribution of Behavior Displayed in Lecture as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	11.6	10.0	13.3
Mid	3.7	4.9	7.9
Late	4.6	6.7	13.3

FIGURE 18

Distribution of Behavior Displayed in Lecture for the Practice and Season Variables



4. Warm-Up

Of the season's aggregate behaviors manifested in the warm-up phase of the practices, 45.6% resulted in the Mid-season (Table 72). Mid-Week and Post-Game practices respectively had 36.7% and 38.4% of the sum behaviors displayed during Warm-Up, but there was a decrease in Pre-Game practices (24.8%) (Table 72).

TABLE 72

Distribution of Behavior Displayed in Warm-Up for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	95	57	72	224	18.7	22.4
Mid	148	80	115	343	38.1	45.6
Late	27	86	127	240	26.7	32.0
Total	270	223	314	807	83.5	
	30	20.3	31.4	81.7		
%	36.7	24.8	38.4			100.0

The following table and graph illustrate the percentages of the behaviors occurring during Warm-Up, in comparison to the sum behaviors, for the entire season (Table 73). Figure 19 shows the pattern for each of the practice variables across the season's variables. While there was some similarity between the Pre-Game and Post-Game practices, Mid-Week practices showed an increment in the Mid-season.

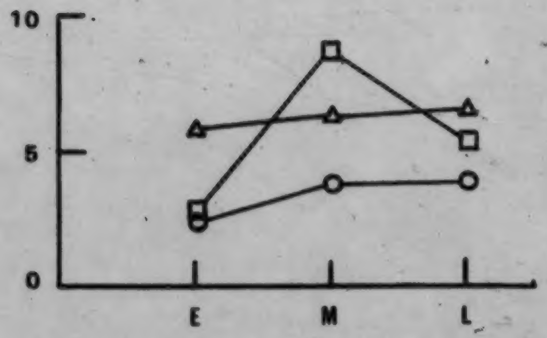
TABLE 73

Distribution of Behavior Displayed in Warm-Up as a Proportion of the Total Behaviors (In Percentages)

	MW	PreG	PoG
Early	2.7	2.6	5.8
Mid	8.7	3.8	6.2
Late	5.4	3.8	6.5

FIGURE 19

Distribution of Behavior Displayed in Warm-Up for the Practice and Season Variables



5. Fitness

Of the season's sum behaviors displayed in the Fitness phase of the practices, there was an almost equal division between the three seasonal variables (Table 74). The data does indicate however, a continued increase over the season. Mid-Week practice (56.6%) had, by far, the largest amount of the aggregate behaviors exhibited during warm-up.

TABLE 74

Distribution of Behavior Displayed in Fitness for each
Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	319	13	96	428	35.6	31.2
Mid	217	58	65	340	37.7	33.1
Late	68	110	188	366	40.7	35.7
Total	604	181	349	1134	114.	
	67.1	16.5	34.9	118.5		
%	56.6	13.9	29.5			100.0

Table 75 and Figure 20 illustrate the percentages of the behaviors that occurred during Fitness, in contrast to the total behaviors, for the whole season.

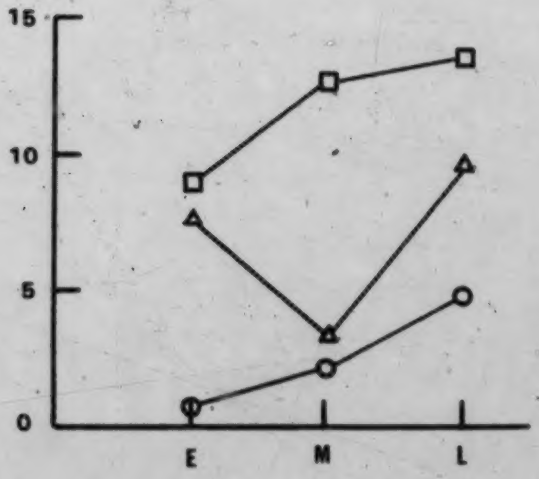
TABLE 75

Distribution of Behavior Displayed in Fitness as a Proportion of the Total Behaviors (in Percentages)

	MW	PreG	PoG
Early	9.0	.6	7.7
Mid	12.7	2.7	3.5
Late	13.6	4.8	9.6

FIGURE 20

Distribution of Behavior Displayed in Fitness for the Practice and Season Variables



6. Intra-Team Game

Of the season's sum behaviors that materialized in the Intra-Team Game phase of the practices, 41.9% happened in the Mid-season (Table 76). Mid-Week practice (52.6%) had by far the largest amount of the aggregate behaviors displayed in the Intra-Team Games.

TABLE 76

Distribution of Behavior Displayed in Intra-Team Games for each Seasonal and Practice Variable

	MW	PreG	PoG	Total		%
Early	540	79		619	51.6	26.7
Mid	242	354	152	748	81.1	41.9
Late	170	327	111	608	60.8	31.4
Total	952	760	263	1975	193.5	
	105.8	69.1	26.3	201.2		
%	52.6	34.3	13.1			100.0

Table 77 and Figure 21 illustrate the percentages of the behaviors occurring during Intra-Team Games, compared to the total behaviors for the entire season.

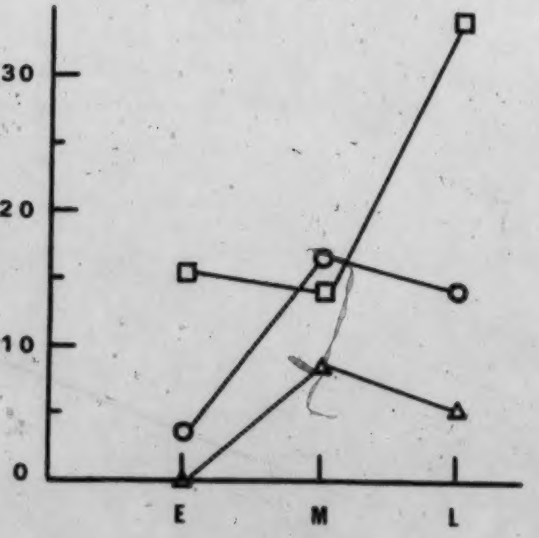
TABLE 77

Distribution of Behavior Displayed in Intra-Team Games as a Proportion of the Total Behaviors
(in Percentages)

	MW	PreG	PoG
Early	15.3	3.6	
Mid	14.2	16.7	8.2
Late	34.1	14.3	5.7

FIGURE 21

Distribution of Behavior Displayed in Intra-Team Games for the Practice and Season Variables



Behavior Sequences

Behaviors were recorded in the order they occurred, providing a serial account of what transpired. Such a series was entered into a matrix two at a time. The first number of each pair indicated the row of the matrix, the second the column. The first pair consisted of the first two numbers. The second pair consisted of the second and third numbers, and thus overlapped the first pair. All tallies entered the matrix as a series of overlapping pairs.

Table 78 indentifies the frequency for each of the cells. The cells on the diagonal from cell 1-1 to 6-6 are called 'steady-state' cells. The tallies in a steady-state cell indicate that the coach persisted in a particular behavior category for at least two behavioral events. All other cells are 'transition' cells moving from one category to another.

TABLE 78

Behavior Sequence Matrix

		VI 1	M 2	A 3	PI 4	SD 5	MA 6
VI	1	3771	1055	2861	483	190	116
M	2	1035	7	150	101		64
A	3	2759	115	170	1143	4	76
PI	4	655	85	935	316	5	19
SD	5	183	7	8	3	12	
Ma	6	99	69	101	4		1

The following procedure was followed to interpret the matrix.

First, the single cell within the six rows and columns which had the highest frequency was located. The pair of events, represented by the cell 1-1, was the most frequently occurring and was used as a starting point in reconstructing the sequence.

Second, from the highest frequency cell, the analyst moves right or left, in terms of sequence, to begin a sequence diagram. The row of any cell indicates the most likely third event, that is, the event which is most likely to follow, given an original pair of events designed by the highest frequency cell. The column, on the other hand, indicates which event most probably preceeded the pair of events in question. The flow of events is properly represented when the eye scans the matrix in a clockwise rotation.

The high frequency in cell 1-1, a steady state cell, indicated that the coach continued this particular behavior category once it started. Proceeding across the first row we find that the 1-3 cell had the next highest frequency. The sequence of behavioral events so far was, Verbal Instruction followed by Verbal Instruction followed by Attending. Scanning column one, the cell most likely preceeding cell 1-1 was cell 3-1. Thus the major behavior sequence identified in this study was, Verbal Instruction followed by Verbal Instruction followed by Attending, which in turn was followed by Verbal Instruction.

Following the same procedure, the most likely secondary behavior sequence was identified as follows: Verbal Instruction followed by

Verbal Instruction, followed by Attending followed by Performance Information.

II. DISCUSSION

Total Behaviors

The results of the study tend to indicate that the frequency of coaching behaviors was fairly consistent over the course of the season. In other words, the mean rate of emission of coaching behaviors was close for each of the variables (Appendix F). There was, however, a decrease of around 6% in behaviors emitted in the Late-season from Mid-season. Late-season practices did tend to become of shorter duration.

The practice variables indicate that there is an increased occurrence of exhibited behaviors during the Mid-Week practices followed by a slight decrease of 2.1% for Pre-Game practices. The further decrease of over 5% in the frequency of behaviors occurring in Post-Game practices may be explained in one of two ways. First, the mean rate of emission of coaching behaviors was much less during Post-Game practices. Second, there was an increase in the frequency of Monitoring behaviors. Monitoring behavior generally occurred for longer periods of time, especially during the Warm-Up phase of the practice. The number of behaviors that occurred during the Warm-Up phase of the practice was higher for the Post-Game than for the other two practice sessions.

Behavior Categories

The breakdown of the total frequency of behaviors shows that Verbal Instruction accounted for half of the behaviors that occurred. If we include other behavior categories which have some verbal content, that is Performance Information and Skill Demonstration, then the total amount of coach talk approximates two-thirds of all coaching behavior. This finding compares with observational studies conducted with classroom teachers, which state that teacher talk comprises one-half to two-thirds of all classroom interaction (Dahloff and Lundgren, 1970; Furst and Amidon, 1967; Furst, 1967).

Verbal Instruction

The graphic presentations for Verbal Instruction illustrate a higher frequency of occurrences during the earlier third of the season. A reasonable explanation for this phenomenon stems from the relative unfamiliarity of coach Drake and his players to each other. Secondly, a high degree of Verbal Instruction was found to occur in the Exercise and Lecture phases of the practices. The data reveal that the frequency of behaviors exhibited during Exercise were at their peak during the Early-season, especially in the Pre-Game and Post-Game practices. The frequency of emission of behaviors during the Lecture phase was also much higher in the Early-season, especially during the Mid-Week and Post-Game practices.

In terms of the percentage of total behaviors, Verbal Instruction increased again as the season progressed into the late stages (see Figure 1 on page).

The increment was again most noticeable in the Pre-Game and Post-Game practices. Late-season, Post-Game practices contributed the highest frequency of behaviors displayed during the Lecture phase than for any other practices. Late-season, Pre-Game practices also experienced an increment in behaviors exhibited during Exercise.

Verbal Instruction throughout the entire season was generally directed toward the Group during Exercise. Throughout the season Drake was helped by an assistant coach which helps to explain why there was a high frequency of behavior directed toward the Group.

Verbal Instruction Sub-Categories

Directing, or telling athletes to do something directly related to the activity, furnished over 70% of all Verbal Instruction behavior. Of the total behaviors, this sub-category happened the most frequently, over 35%.

Tharp and Gallimore (1976) reported in their study of John Wooden, the UCLA basketball coach, that their subject engaged in Instructions, verbal statements about what to do, or how to do it, 50.3% of the time. Caution must be expressed, however, in attempting to make any hard and fast comparison between the two coaches.

The use of directions by teachers has been reported to occupy 10% or less of all classroom interaction time (Dahloff and Lundgren, 1970; Furst, 1967; Tisher, 1970). Again, caution must be proclaimed in making comparisons between the coaching and teaching environments. A comparative research study may provide some insight into relationships between the two environments.

Directing behavior was very frequent during Early-season. This is explained through the high proportional relationship to its parent category - Verbal Instruction. Directing was least frequent during the Mid-season, especially during Post-game practices.

Patterns of Directing behavior were very similar for the three practice variables for most of the season. These patterns were illustrated earlier (Figure 2 on page 59). Directing behaviors were primarily aimed at the Group during Exercise.

Explaining represented over 13% of all Verbal Instruction behaviors and close to 7% of the total behaviors. Nearly one-half (48%) of all Explaining took place during the Lecture phase of the practices. The use of Lecture varied from approximately four to 13 percent of the total practice phases. Explaining was usually directed toward the Team during the Lecture phase of the practices.

Studies of teachers show that their use of lecturing comprises 16 to 25% of all classroom interaction time (Dahloff and Lundgren, 1970; Furst and Amidon, 1967; Furst 1967).

Informing behaviors were in response to questions posed by the Individual athletes or Auxillary Personnel usually during Exercise and Transition. The results of this study indicate that very few questions were directed toward the coach.

The employment of Questioning by the coach was also quite low, though questions were directed toward Individuals most of all, there was also a fair degree of distribution among the other Behavior Direction variables.

Studies have shown that teachers' questions represent a tenth to sixth of all classroom interaction (Dahloff and Lundgren, 1970; Furst and Amidon, 1967; Furst, 1967) and that the higher grade level (and presumably the older ages) is associated with less teachers' use of questions (Furst and Amidon, 1967).

Verbal statements intended to activate or intensify the present behavior of the athletes, or previously instructed behavior, was usually directed toward the Individual. The Group also received a good portion of these Hustles. This behavior was, for the most part, exhibited during the Fitness and Exercise phases of the practice.

Monitoring

There was an increased incidence of Monitoring behaviors during the Mid-season in all three practice variables, especially during the Transition, Exercise, and Warm-Up phases of the practices. This trend was converse to the decreasing incidence of Verbal Instruction behaviors that occurred during the Mid-season.

Behaviors exhibited during Transition (Figure 7 on page 86) reached their peak frequency during Pre-Game and Post-Game practices in the Mid-season. Warm-Up occurred more often during the Mid-Week and Post-Game practices, but especially so in Mid-season. The frequency of Exercise reached its third highest point of the season during Mid-season, Post-Game practices.

Monitoring behavior was overwhelmingly displayed during teamorientated activity. The data reveals that behaviors directed toward the Team reached their highest frequency during Mid-season, Post-Game practices. This finding gives support to the relationship noted above.

Attending

Mid-Week and Pre-Game practices were very stable, following a parallel pattern for the first two season variables. The divergence between these two variables in the last third may have been invalid; caused by the limited number of Late-season, Mid-Week practices from which to draw data. There was a limited variation of frequency between all three practice variables Mid-season.

Attending behavior was primarily directed toward the Group during Exercise.

Performance Information

The frequency of Performance Information increased to its highest level during the Mid-season. It was at this time in their league schedule that the varsity team began to show their superiority. The team was undefeated during this phase of the season, and had started to expand their point lead in the league standings. The data reveals that positive evaluation was at its highest point in Mid-season.

In the teaching environment, it has been found that teachers give more praise to higher achieving pupils (Good et al, 1973), and that teachers give more praise to pupils for whom they have expectations of high achievement (Brophy and Good, 1970; Kranz et al, 1970; Rubovits and Maehr, 1971). It seems plausible that at this stage of the season, Coach Drake had high expectations for his team.

It is interesting to note that the use of positive evaluation was on the average, least frequent during the Post-Game practices with the exception of Post-Game practices in Mid-season. Thus, though the coach had high expectations for the team and praised them accordingly during the Mid-Week and Pre-Game practices, the use of praise was less in the practices immediately following the weekend series of games. The data seem to indicate that the use of praise is not necessarily contingent upon the realization of those expectations. This finding agrees with a number of researchers (Felsenthal, 1970; Flanders, 1970; Harris and Serwer, 1966; Harris et al, 1968; Hunter, 1968; Perkins, 1965; Soar et al, 1971) have found that teacher praise is unrelated to pupil achievement. Consideration must also be given to the time lapse between the games and the following practice as a plausible reason for the lower frequency of praise during Post-Game practices. The coach may have sufficiently rewarded the team during the intervening period.

More than half of the negative evaluations were delivered in the Early-season, especially in the Post-Game practices. After one game in which the team had relinquished a 4-goal lead, negative evaluation was quite frequent. Greater teacher criticism is associated with lower pupil achievement (Flanders, 1970; Harris and Serwer, 1966; Harris et al, 1968; Hunter, 1968; Soar, 1968; Spaulding, 1963).

Negative evaluation was at its lowest point in Midseason at which time, as we have already noted, the team was gaining the upper hand on its opponents. The lower use of scolds may have been associated with the coach's achievement expectations for the team at this point in the schedule. Brophy and Good (1970) and Dalton (1969) found a similar relationship relative to the use of scolds by teachers and expectations for their students. Negative evaluation showed a slight increase in the Late-season, but not during the Pre-Game practices.

The data results suggest an opposite relationship or pattern, between positive and negative evaluation throughout the entire season, with positive evaluation always in the superior position. Presumably, rewarding behaviors are a "good" thing to do. The ratio of 3:1 in favor of positive evaluation is close to the estimate theorized by Rushall (1975) who feels the positive should exceed the negative by 4:1.

Tharp and Gallimore (1976) reported that Wooden's exhibited rewarding behaviors, verbal and non-verbal, were 8.1%. The results of this study reveal that Drake's frequency of rewarding behaviors was very similar. On the average, teachers use rewarding behavior no more than 6% of the total time (Altman, 1970; Dahloff and Lungren, 1970; Flanders, 1970; Furst and Amidon, 1967; Lohman et al, 1967; Perkins, 1964; Tisher, 1970).

Coach Drake's punishing behaviors contributed 2.5% of the total behaviors. Conversely, the frequency of Wooden's punishing behaviors were as high as 14.6%. The studies cited in the previous paragraph claim that teachers use criticism, or punishing behavior, less than 6% of the total time on the average.

Feedback and Correcting behaviors occurred with far greater frequency during the Mid-season, and Mid-Week and Post-Game practices, especially the latter. Feedback and Correcting statements continued to increase during all practice variables as the season progressed, but dropped markedly, with the exception of Mid-Week which continued to increase, during the Late-season.

Performance Information was primarily directed toward the Individual and secondarily toward the Group. Fitts and Posner (1967) claim that performance information behaviors are more powerful when they are directed toward the individual. Exercise and Intra-Team Games are the two phases of the practice where Performance Information is most frequently emitted, especially the former.

Skill Demonstration

The use of Skill Demonstration comprised a very small amount of the total behaviors exhibited by the coach. Some people may be surprised by this result, claiming that modelling behaviors are an integral part of the development of motor skills. This may be true for younger, more inexperienced athletes, but the data, from this study, suggests that it is not that necessary in changing the performance behaviors of university level athletes. If one feels, however, that the degree of complexity of motor skills is similar, then we would have expected to see more Skill Demonstration behavior from our subject. That is, "simple" skill for a professional athelte would be complex for the university athlete, and the simple skill for this athlete would be complex for the younger athlete.

Skill Demonstration mostly took place in the Early-season for all practice variables. Each practice variable showed a decrease in the Mid-season which then continued into the Late-season with the exception of the Mid-week practice variable which increased slightly.

Coach Drake stressed doing the basic skills well. This philosophy would partially explain the greater frequency of Skill Demonstration behaviors during the Early-sedson. It is recalled that the players on the varsity team were, for the most part, somewhat unfamiliar to Drake and he to them. In addition, as the required skills and maneuvers became permanent in the athlete's skill repertoires, there would be less need to demonstrate.

Skill Demonstration behavior was usually performed in front of the entire team, and occasionally to a Group, during the Lecture phase of the practice.

Managing

Managing behavior such as placement of pylons on the ice, moving and adjusting the position of the goals for various shooting drills, and checking notes occurred with greater frequency in the Early-season, then decreased and stabilized in the Mid- and Late-seasons.

The pylons appeared to be used to assist the players in the development and performance of various skill acquisition/improvement Exercises. One might safely speculate that the decreased deployment of the pylons corresponded with an increased understanding by the players of what they were expected to do.

Managing behavior was almost entirely performed in a "vacuum," that is, Alone. This behavior was generally performed during Exercise and Transition.

Behavior Direction

In terms of the total number of displayed behavioral units, those behaviors directed toward the Group were almost double the combined tally of the Individual and Team categories. In terms of their frequency, behaviors directed toward the Group were superior in every cell of the matrix. However, there were some interesting patterns displayed by the data (see Figures 12, 13, and 14 on page

During all three practice variables, behavior directed toward the Group declined in Mid-season, but increased sharply as the season proceeded into the Late-season. Behaviors directed toward the Individual displayed the opposite trend, showing an increase in the frequency of their occurrences during the Mid-season. The trend was reversed in the Late-season except in the case of Post-Game practices where a growth in frequency had continued. Behavior directed toward the Team was stable for both Mid-week and Pre-Game practices through the entire season. This behavior occurred at a higher frequency in Post-Game practices during each phase of the season, displaying a similar pattern to the Mid-Week and Pre-Game practices for Individual behaviors. A summary of Behavior Direction for each major Behavior category is located in Appendix G.

Practice Phase

The various phases of the practice help set the stage for a behavior to be emitted. In turn, they also affect, to some degree, the directionality features of the behavior. Within each of the practice phases there are discriminative stimuli which cue the behavior to follow. Therefore, it was important that this study address itself to the practice conditions in which the behaviors were displayed.

The greatest frequency of coaching behaviors occurred during the Exercise phase of the practices. The Exercise phase consisted of activities designed to improve the performance capabilities of the athletes. As such, one would also hope, if not expect, to see a concurrent increase in behaviors designed to modify and improve skill behavior, especially in the early stages of the season. The results of the data support this. The highest frequency of behaviors happening during Exercise occurred in the Early-season during the Pre-Game and Post-Game practices. Verbal Instruction also recorded its highest frequency at these phases of practice.

Performance Information has proved to be an important tool for producing behavior change. Rushall (1975) has stated that performance information produces motivated behaviors which increase as performance standards improve. He feels that providing this information to the athletes is the most important feature of coaching.

The frequency of Performance Information was at its highest during the Mid-season. The frequency of behaviors that occurred during Exercise at that time was quite high, especially in the Pre-Game and Post-Game practices which recorded frequencies in excess of 52%. Over 67% of all Performance Information happened during Exercise.

Transition was identified in this study as that phase of the practice in which the second highest occurrence of behaviors took place. Over 23% of all Verbal Instruction was transmitted during Transition. The Transition phase was an opportunity to give directions, explain instructions, answer questions, ask questions and perform Managing behaviors. Monitoring and Managing behaviors, respectively, had high frequencies of occurrences in this phase.

The Lecture phase was the stage in which most Skill Demonstration took place. The coach would assemble the Team and demonstrate the required task or skill.

The remaining, less predominant relationships are summarized in Appendix H.

Behavior Sequences

The two major behavior sequences that were identified in the results of this study were as follows:

1.	VI	VI	A	VI
2.	VI	VI	A	PI

The primary behavior sequence was started with a sub-category of Verbal Instruction, usually Directing-telling the athletes to do something. The initial behavior was almost immediately followed by another Verbal Instruction, again, it was usually Directing. Then followed an Attending behavior, a period of time during which the coach observed the athletes performing the task to which they had been directed. The Attending behavior was usually followed by either another Verbal Instruction or some form of Performance Information. Because of the large number of sub-categories there were many secondary sequences that came to pass and to identify each would be a major study of its own. For the reader who is interested in identifying the secondary sequences, he/she is referred to the Behavior Sequence Flow Chart in Appendix I.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The primary purpose of this study was to provide, through a descriptive analysis approach, a scientific identification and description of coaching behaviors.

With the lack of research in the area of sport coaching utilizing behavior analysis, no definite identification of coaching behaviors has been made. Through this research a contribution toward discovering and understanding coaching behaviors, including a process for scientifically analyzing coaching behaviors, will hopefully have been made.

The descriptive, in depth, case study analyzed the coaching behaviors of a nationally recognized coach utilizing an observation technique of data gathering as prescribed by the behavioral school of psychology. The observation schedule, Alberta Coach Observation Schedule, provided a method of obtaining data from original events.

The Alberta Coach Observation Schedule was developed by the author in the first phase of the study. Revisions relative to the distribution of the sub-categories within the major categories were made, without affecting the data analysis, during the second phase of the study. The observation schedule developed by Tharp and Gallimore (1976) to observe a university level coach, and the Dalhousie Coach Observation Schedule devised by Rushall (1973c) constituted the foundation for the schedule.

The data treatment designs were as follows:

1. A three by three cell matrix which allowed a descriptive analysis to be made of the relationship between the Behavior, Behavior Direction-, and Practice Phase - categories relative to the three Season and three Practice variables; and
2. a Behavior Sequence Matrix which preserved the original serial context of the behaviors.

Conclusions

1. The predominant coaching behaviors exhibited by the coach in this study were, in the order of their total frequency of occurrence:

   Directing
   Attending
   Monitoring
   Praise
   Explaining

2. Throughout the season the exhibited behaviors were fairly consistent in their frequency of emissions, and where there was a deviation it appeared as a result of the situational demands within the seasonal and practice variables.

3. The two major behavior sequences identified in the study were:

   (a) VI VI A VI

   (b) VI VI A PI

Recommendations

1. Further use of the ACOS utilizing all of its sub-categories should be done through the employment of video recordings.
2. Live observation should only use the abbreviated form of the ACOS (Appendix J).
3. Further study relative to the content of Performance Information should be done through employment of the ACOS-PI form (Appendix K).
4. Future research should direct itself to the relationship of the antecedent and consequent behaviors of coach-athlete behavior. Such research would require a more sophisticated method of data collection using at least two cameras and a mixer.
5. Future studies concerned with the analysis of coaching behaviors could address themselves to the following questions:
   (a) What are the predominant coaching behaviors at the various levels of athletic performance, i.e., community-league, high school, professional, etc.?
   (b) Do predominant coaching behaviors differ between team and individual sports?
   (c) What are the relationships between the predominant coaching

behaviors and the number of years a person has been coaching?

(d) Are there relationships between predominant coaching behaviors and the coach's age? Sex? Are the predominant coaching behaviors different for male coaches involved with female athletes than for a male coach - male athlete relationship and vice-versa?

(e) Is coaching behavior related to the length, and the content of the coach's training?

(f) Are there identifiable patterns of skill demonstration?

(g) Is the frequency of skill demonstration by the coach a function of the competency levels and ages of the athletes?

(h) What are the ratios regarding the use of positive and negative evaluation, exhibited by coaches?

(i) How specific is the content of performance information?

(j) Is the use of performance information related to the athlete's performance improvement?

(k) Is the content of performance information related to athlete's performance improvement?

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APPENDIX A

ALBERTA COACH OBSERVATION SCHEDULE FOR VIDEOTAPE RECORDINGS

The body of this Appendix has been photostatically reduced so that it will fit on a single page.

ALBERTA COACH OBSERVATION SCHEDULE

DAILY RECORDING SHEET

SESSION NO: DATE: TIME START: TIME END:

V I					M	A			FI					SD				Ma	Misc			Behavior -			Direction		Practice	Phase				
D	E	I	Q	H			V+	NV⁺	S	NV⁻	S-R	F	C	NoH-	Noe	No-			N	O	X	I	G	T	A	AP	E	X	L	W	P	IO

APPENDIX B

SPECIMEN OF DAILY SESSION MASTER SHEET

Date: Oct. 27/76
Total: 605

Session: 1 /AVI

	D	E	I	Q	H	Λ	A	V°	W°	S	W'	SR	F	C	K°	K'	Ka	Ko	Aa	N	O	X	I	G	T	A	AP	E	T	L	W	F	IQ
1	15	3		1		9	2	2		4				1			2		2				14		23	3	1	32	4	5			
3	19	3				9	1	3		3											3		8	6	25		2	35	6	2			
5	16				2	11	2						1						5	1	3		4	12	14	6	5	31	10				
7	15					5	13	1		1		1							1		4		17	11	8	2	3	31	10				
9	10	2			1	2	11	10		2									1		2		15	14	11	1	2	30	9	2			
11	14	11	1	1	1		5			1			1	1			2	1			1	1	10	8	20		3	9	4	28			
13	19	4			1	1	9	4													1	2	7	31	3			40		1			
15	18		1	3	1		11	5		6		1											16	23	2			37	4				
17	13	4		2	3		12	1		1				2			2		1				10	19	11	1		26	11	4			
19	17	5			2		3	8		5									1		3	2	3	27	8	1	2	32	2	7			
21	21	1	1	1	2		2	12														1	3	37	1			35	4	2			
23	17	5	1	1	4		6	3											2		1		5	33	1		1	14	1	5			13
25	13	3	1	1		2	8			4		1					1	1	4		1	1	11	22	7		1		9	4		1	27
27	15				4	8		3		6		1									4		9	30	2							41	
29	8				6	7		4		2											5		7	16	9				1			31	
																									145								
Totals	247	41	5	10	27	54	85	45		35		4	2	4			7	2	17	1	28	7	137	249	148	14	20	338	75	60		73	

APPENDIX C

SEASON AND PRACTICE VARIABLES MASTER SHEET

EARLY SEASON

EARLY SEASON PRACTICES

Nº	S'n	ΣΣ	D	E	I	Q	H	Σ	M	A	V'	N'	S	N'	SR	F	C	Σ	M°	M⁻	Mo°	Mo⁻	Σ	Mo	N	O	X	Σ	I	G	T	A	AP	E	T	L	W	F	16
1	AW	605	247	41	8	16	27	310	24	95	43		83		4	2	4	94			7	2	9	17	1	28	7	36	137	289	143	14	20	135	73	40		73	48
2	RoG	507	142	82	7	18	20	233	35	112	10		27		8		1	63			9	1	10	18		4	5	9	93	275	108	1	14	168	36	41		15	29
3	RoG	402	141	15	4	7	12	236	17	42	7		14		7		3	91						5		10	3	13	61	216	91	5	24	128	27	4	1	43	
4	AW	971	310	91	4	29	80	311	40	226	94 99	3	129		9	2	13	147	1	1	18	8	20	13		7	3	10	247	443	220	15	24	439	136	58	30	40	129
5	RoG	694	186	42	17	12	18	302	33	102	20		20		1		8	82			9	1	10	14	1	7	10	18	178	375	107	17	23	330	84	80	1		
6	RoG	455	181	43	17	23	11	240	20	113	8		19				2	85			16	1	17	14		8	1	9	121	156	141	14	23	335	35	112	38	40	
7	AW	790	272	47	14	17	40	340	37	220	80	2	20		1	4	2	149			6	1	7	9		9	9	18	170	423	149	10	14	382	127	61	47	58	102
8	AW	548	174	29	16	20	19	258	11	101	72	2	4		4	6	9	91			3		3	11		1	6	7	133	329	56	11	19	176	96	82	1	39	114
9	RoG	485	143	39	8	20	5	230	22	120	13		11		1	4	4	35			10	1	11	6	1	5	5	9	115	174	115	8	23	235	115	50	37		
10	RoG	383	132	35	6	9	8	187	31	147	13		2		2	2	13	32			6	1	7	13	1	3	2	6	86	131	149	13	22	238	83	42	38	11	
11	AW	609	186	82	24	35	10	337	40	179	13		9		2	3	8	85	1		7		8	17		2	11	13	183	139	203	22	40	233	114	167	17	40	48
12	RoG	552	313	40	19	11	7	310	26	143	10		16	1	7	1	16	87			5		5	8		5		1	133	103	104	7	6	241	93	47	19		80
	Σ	8431	5634						1728 38	420 8	795								105					142	151														

AW 8523 1143 830 70 111 180 1080 871 313 313 7 87 20 17 36 2 1 28 6 17 84

RoG 2188 846 138 91 85 80 116 173 83 74 1 14 5 26 31 5 43 59

RoG 1240 916 91 30 41 28 96 282 28 91 9 2 18 28 2 32 28

APPENDIX D

SEASON AND PRACTICE VARIABLES MASTER SHEET

MID-SEASON

MID SEASON PRACTICES

N°	S'n	ΣΣ	D	E	I	Q	H	Σ	M	A	V'	W'	S	Wi	SR	F	C	Σ	A°	A⁻	N°	N⁻	Σ	Ma	N	O	X	Σ	I	G	T	A	AP	E	T	L	W	F	16
13	AW	116	42	5	1	1		49	17	24	7		3				2	12			1		1	10	1		2	3	36	20	81	9		70	19	12	15		
14	RaG	668	234	28	23	24	11	320	48	106	57	2	3		2	5	12	81			5	1	6	5		11	3	14	264	123	132	8	39	349	117	35	24		143
15	PoG	525	176	30	11	18	3	238	61	149	36	1	10	1	2	3	25	78			1	5	6	5		1		1	224	65	148	5	35	321	134	34	36		
16	AW	748	243	35	19	26	10	333	72	200	63		17		1	5	31	117	1		4		5	7	1	11	2	14	190	154	137	10	37	120	137	43	60	84	64
17	RaG	680	236	43	11	22	11	323	69	102	17		8		8		20	63			10	1	11	10		38	2	40	224	202	158	12	24	433	134	28	19		76
18	PoG	693	202	40	7	18	10	277	63	202	84	1	10		1	4	35	135			4	1	5	6		7	1	8	157	303	205	6	25	359	114	21	37	10	132
19	RaG	771	241	38	12	22	27	340	74	235	82	1	13	1	1	6	8	112			6		6	7		3	4	7	184	300	179	7	30	332	109	40	37	58	133
20	PoG	644	219	38	10	29	20	316	80	140	34	5	2		2	1	16	59	2		15	3	20	18		2	3	5	136	213	216	19	50	134	121	92	42	55	
21	AW	841	284	45	10	20	54	411	49	300	106	2	8		1		10	127			2		2	8		2	2	4	211	420	179	8	18	347	122	8	35	135	178
	Σ	5686	1807	320	108	174	140		573	1445	508	12	64	2	13	24	159		3		48	11		71	2	75	19												
			2631								701										62				96														
	AW	1705	509	83	30	47	60		180	424	176	2	21		2	5	43		1		7			20				21											
	RaG	2119	741	109	46	68	49		141	581	126	3	21	1	6	11	40				21	2		22				61											
	PoG	1862	517	128	58	84	33		190	437	134	7	22	1	5	8	76		2		20	9		29				14											

APPENDIX E

SEASON AND PRACTICE VARIABLES MASTER SHEET

LATE-SEASON

LATE SEASON PRACTICES

Nº	S'n	ΣΣ	D	E	I	Q	H	Σ	ΛA	A	V'	N'	S	N√	S-R	F	C	Σ	Λ+	Λ-	Λo+	Λo-	Σ	Λa	N	O	X	I	G	T	A	AP	E	T	L	VI	F	IG
22	PoG	475	137	38	12	29	25	241	40	122	30		8	4	1	7	13	63						4		4	1	145	221	79	4	6	247	87	74	14	53	
23	PaG	578	209	39	10	17	3	278	41	144	48	1	4	1		2	4	60			3		3	5		6	1	148	315	74	6	5	201	104	34	23		136
24	PoG	532	202	36	7	24	17	286	38	149	15		8				13	36			6	1	7	14		7		183	249	94	12	12	332	82	30	31	77	
25	PaG	496	177	48	5	18	3	251	36	142	34	1	8	3	8		3	49			2	1	3	5	1	4	2	131	243	99	6	17	353	62	49	30		
26	PoG	385	125	61	1	12	1	200	42	83	22	3	7		1	1	2	36			13	1	14	3		1	6	90	102	128	3	12	136	70	83	36		22
27	PaG	543	233	38	4	17	1	293	55	131	41	1	8			1	3	54			2		2	7			1	115	306	112	7	3	304	46	48	29		
28	PoG	547	183	48	8	13	11	263	57	120	32		11			11	11	65			11		11	9		9	13	163	249	171	9	15	203	94	73	29	50	89
29	ΛW	489	174	26	7	7	12	226	31	134	36		9	2	2	3	13	65			4	1	5	6		5	7	111	280	96	6	6	138	73	23	37	48	170
30	PaG	667	230	29	7	6	21	293	81	178	60	1	7	1	4		9	82			2		2	12		16	6	148	303	198	12	10	222	134	22	8	40	171
	Σ	4742	2331						421	1203	501								47					65	90													

ΛW 489 174 26 7 7 12 31 134 36 9 2 2 3 13 4 1 6 5 7

PaG 2284 849 154 26 58 28 213 595 183 4 27 5 7 3 19 9 1 29 1 26 10

PoG 1939 647 183 28 78 54 177 474 99 3 34 4 2 19 39 30 2 30 21 20

APPENDIX F

MASTER PREQUENCY DISTRIBUTION ACROSS PRACTICE AND SEASON VARIABLES

VI	50.7	53.9	54.1	46.5	47.8	44.3	45.3	49.7	50.6
M	5.3	5.3	7.7	11.0	9.0	10.4	6.2	9.3	9.8
A	24.7	26.2	22.7	24.9	26.0	26.7	30.9	26.8	24.7
Pl	13.7	9.4	8.7	14.7	12.2	14.6	13.0	10.9	9.7
SD	1.3	1.6	1.9	.5	1.1	1.7	1.0	.4	1.6
Ma	1.9	1.7	2.6	1.2	1.0	1.6	1.2	1.3	1.5
Misc	2.4	1.8	2.3	1.2	2.9	.8	2.4	1.6	2.1
I	24.	23.6	22.1	27.2	27.6	22.5	22.2	24.7	27.0
G	48.	50.7	42.5	38.5	44.8	36.5	56.1	51.3	44.8
T	22.3	20.5	30.7	28.3	22.1	33.4	19.2	20.7	24.5
A	2.1	2.0	2.7	3.2	1.1	1.6	1.2	1.3	1.4
AP	3.5	3.1	6.0	2.3	4.4	5.9	1.2	2.0	2.3
E	47.2	66.2	63.1	48.9	52.5	54.9	27.7	54.3	47.5
T	14.3	16.6	10.7	16.4	19.7	20.3	14.6	17.5	17.2
L	12.5	9.9	12.7	5.7	4.8	7.9	4.6	7.0	14.0
W	2.4	3.0	5.8	10.1	3.7	6.2	5.4	4.0	6.9
F	8.8	.7	7.6	9.0	2.5	3.3	13.6	4.1	8.9
1G	14.8	3.7	.0	9.9	16.7	7.3	34.1	13.2	5.5
Practice	MW	PreG	PoG	MW	PreG	PoG	MW	PreG	PoG
Season	EARLY			MID			LATE		

P

APPENDIX G

RELATIONSHIP OF BEHAVIOR CATEGORIES TO BEHAVIOR DIRECTION

BEHAVIOR DIRECTION

	I	G	T	A	AP	%
VI	27.5	42.4	26.2	.02	3.9	100.0
M	.1	16.7	83.2			100.0
A	12.2	75.6	7.1		5.1	100.0
PI	63.4	31.3	5.2		.05	100.0
SD	6.1	21.0	72.9			100.0
Ma	1.1	3.2	1.1	94.6		100.0

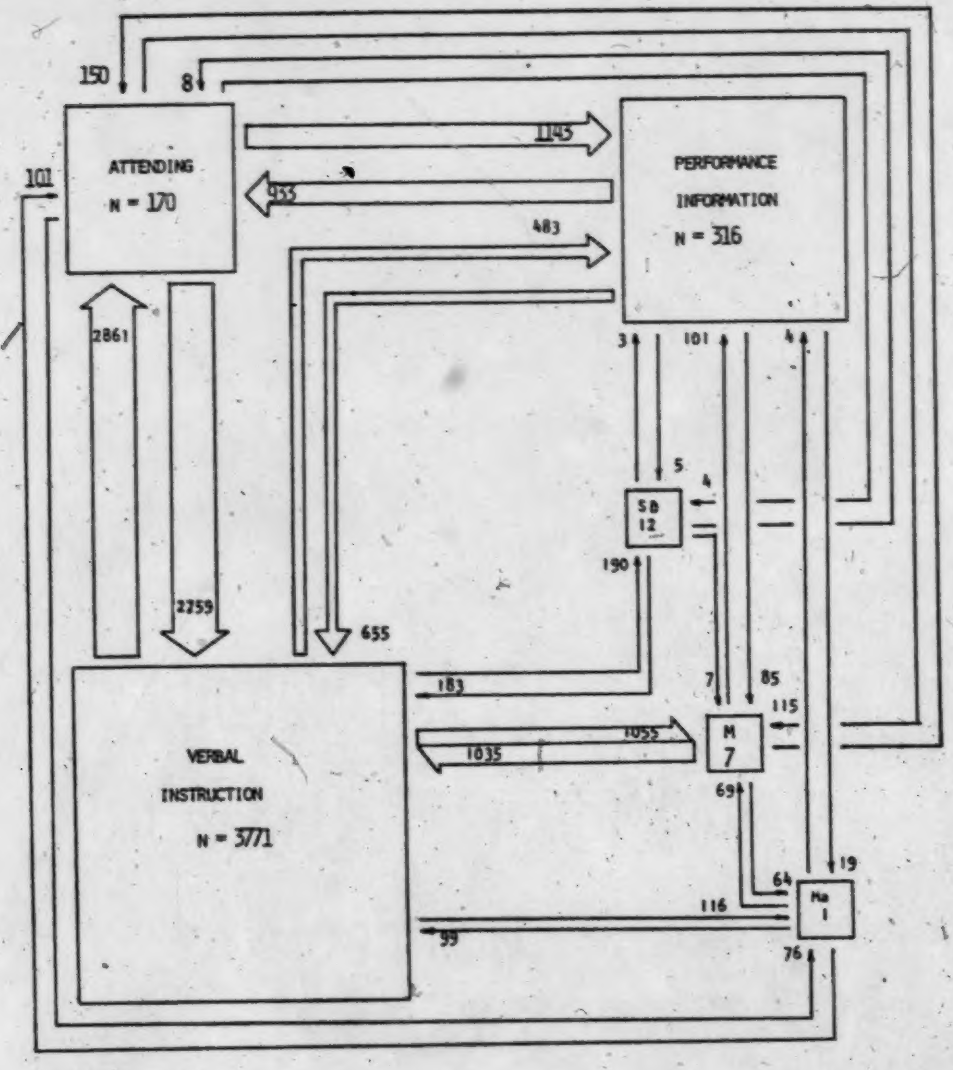
APPENDIX H

RELATIONSHIP OF BEHAVIOR CATEGORIES TO PRACTICE PHASE

PRACTICE PHASE							
	E	T	L	W	F	1G	%
VI	43.9	23.1	12.8	4.0	7.0	9.2	100.0
M	32.8	34.1	.07	18.6	12.6	1.8	100.0
A	68.8	5.1	3.9	2.5	3.9	15.8	100.0
PI	67.1	2.0	3.4	1.4	6.3	19.8	100.0
SD	11.7	3.3	80.4	.5	.5	3.7	100.0
Ma	48.2	32.7	.4	10.8	5.4	2.5	100.0

APPENDIX I

BEHAVIOR SEQUENCE FLOW CHART


ATTENDING
N = 170
PERFORMANCE
INFORMATION
N = 316
SB
M
VERBAL
INSTRUCTION
N = 3771
Ma

APPENDIX J

ALBERTA COACH OBSERVATION SCHEDULE

ABBREVIATED FORM

ALBERTA COACH OBSERVATION SCHEDULE

ABBREVIATED FORM

Daily Recording Sheet For Coaching Behaviors

Coach's Name .... Sport ....

Date .... Session No. ....

Behavior Category	Time Interval															
	0 - 10					10 - 20					20 - 30					Total
	I	G	T	A	AP	I	G	T	A	AP	I	G	T	A	AP	
Verbal Instruction																
Monitoring																
Attending																
Performance Information																
Skill Demonstration																
Managing																
Miscellaneous																
Totals																

Comments

APPENDIX K

ALBERTA COACH OBSERVATION SCHEDULE

PERFORMANCE INFORMATION

ALBERTA COACH OBSERVATION SCHEDULE

PERFORMANCE INFORMATION

Daily Recording Sheet For Coaching Behaviors

Coach's Name .... **Sport** ....

Date .... **Session No.** ....

Category	Time Interval															Total
	0 - 10					10 - 20					20 - 30					
	I	G	T	A	AP	I	G	T	A	AP	I	G	T	A	AP	
Praise																
Non-Verbal Reward																
Scold																
Non-Verbal Punishment																
Scold-Reinstruct																
Feedback																
Correcting																
Totals																

Comments